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EP4 Evaluation Report

Technical Paper

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Abstract

The Evaluation Package 4 (EP4) was released on January 11, 1995 and evaluated in the following two month period. Two methods of evaluation were employed: Usability Testing and an Independent Evaluator survey implemented as the Interactive Evaluation Tool (IET). The results of both evaluation methods: comments, observations, survey scores, and time to complete usability test tasks are analyzed in this report. These two methods were chosen because they complement each other and collect data at different levels of detail.

Statistical results show that most EP4 capabilities received positive scores. User comment confirms these results. Usability tests revealed that users were able to complete all tasks within the acceptable time. However, as with any prototype, suggestions for improvements were made by the EP4 Evaluators. Over 1300 comments were received, 21 of these were entered into the User Recommendations Database (URDB) as formal recommendations to ECS.

In addition, lessons learned from the EP4 Usability Testing and EP4 IET are provided. Recommendations to developers and answers to some of the Evaluators' most frequently asked questions are included in Chapter 6.

A summary of results gathered from EP4 Evaluation:

Advertising Service:

- More thought should be given to the look and structure of information provided in the Advertising Service, what links are called, and where they are located.
- ECS should provide a "Road map" of the Advertising Service so that users can see the overall structure of the Advertising Service; expert users could use this as a means of getting straight to the service or information they need.
- Link management and the quality of text and information provided in the Advertising Service must be improved.
- Improvements on the Advertising Service Search Forms in terms of content and design where provided, they should be incorporated into the next version.

EOSView:

- EOSView file structure window needs to be made easier to use - highlight image files, rename/re-word cryptic text.
- Zooming and panning features in EOSView are liked but need some refinement, i.e., ensure panning window stays "in synch" with viewing window.
- Removing technical HDF text from the EOSView file structure window would make the viewer easier to use, especially by those users who are unfamiliar with HDF.
- EOSView should include a means for users to view metadata, without this capability it will be very difficult for users to order data.

Scientists' Workbench:

- Window management is improved since EP3, but Participants found it difficult to navigate through different levels of the Workbench (e.g. the "Go Back" button).
- Scientists' Workbench shows real potential, needs more work to make file management easier. Users want to move more than one file at a time and use of control keys.
- Placement of items in the Scientists' Workbench pull-down windows should be examined and improved. Some items are better placed in other menus. Do not use acronyms in menus.

General Comments:

- Consistency within EP4 is an issue - e.g. fonts, placement of buttons and double- vs. single-clicks for certain functions.
- A Style Guide should be available to developers to improve look and feel consistencies among ECS and Advertised services and applications.
- Participants liked the use of Mosaic interfaces to present Help information and as the Advertising Service interface, however, more Mosaic capabilities should be provided (hot list, search "escape/abort" button, etc.)
- EP4 Help must contain better and more information on what EP4 services, applications, and objects are available, how they work, and why they should be used.
- Feedback indicators (e.g., hourglass, stopwatch, etc.) must be consistently implemented in ECS. Indication of system activity must be improved (e.g., an indication that command was accepted and being processed).
- Users want more control over the ECS environment, for example through user preferences and file management options. But user limits should be enforced by ECS, for example, when re-sizing windows (maximum and minimum sizes) and warnings given before deletion of applications. Users want more control over EP/ECS environment, user preference file and capabilities should be prototyped.
- Interactive Evaluation Tool (IET) could be improved through the use of scrolling windows and a "data saved" indicator.

Keywords: Evaluation Package 4, EP4, Usability Testing, Survey, IET, Interactive Evaluation Tool, URDB

Contents

Abstract

1. Introduction

1.1	Purpose	1-1
1.2	Organization	1-1

2. Background

2.1	EP History	2-1
2.2	Evaluation Methods	2-2
2.3	Process for Incorporating Evaluation Results into ECS	2-2
2.4	Key Terms Used in This Document.....	2-3

3. Incorporation of EP3 Comments in EP4

3.1	EP3 Comments: Top Level	3-1
3.2	EP3-Related URDB Entry	3-2

4. Usability Test Results

4.1	Test Design and Methodology	4-1
4.2	Test Results	4-2
4.2.1	Advertising Service	4-2
4.2.2	EOSView	4-6
4.2.3	Scientists' Workbench	4-10
4.3.4	General	4-13
4.3	Usability Test Times	4-16
4.4	Summary of Responses from the Exit Survey	4-18
4.4.1	Evaluators' Previous EP Experience.....	4-18
4.4.2	Evaluators' Previous Computer Experience	4-18

4.5	Lessons Learned from EP4 Usability Testing.....	4-19
4.6	Usability Test Results Summary	4-20

5. Interactive Evaluation Tool (IET) Survey

5.1	Survey Design	5-1
5.2	Survey Results.....	5-2
5.2.1	Advertising Service	5-3
5.2.2	EOSView	5-7
5.2.3	Scientists' Workbench	5-11
5.2.4	General	5-14
5.3	Lessons Learned from the IET Survey	5-17
5.4	IET Results Summary	5-17

6. Summary of EP4 Evaluation

6.1	EP4 URDB Entries.....	6-1
6.2	Recommendations to Developers.....	6-6
6.3	Answers to Frequently Asked Questions by EP4 Evaluators	6-7

7. Bibliography

Figures

4-1.	Usability Test Environment	4-1
4-2.	Schedule of a Usability Test Session and the Corresponding Section of the EP4 Evaluation Report.....	4-2
4-3.	Advertising Service: Average Scores and Standard Deviations	4-4
4-4.	EOSView: Average Scores and Standard Deviations	4-8
4-5.	Workbench: Average Survey Scores and Standard Deviations	4-11
4-6.	General: Average Survey Scores and Standard Deviations	4-14
4-7.	Average Times for Completion of Test Tasks by Participant Category	4-17

4-8.	Time to Complete Usability Tasks by Test Session Number	4-18
5-1.	IET Survey Development and Implementation Process	5-2
5-2.	Advertising Service: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response	5-4
5-3.	EOSView: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response	5-9
5-4.	Workbench: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response	5-12
5-5.	General: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response	5-15

Tables

4-1.	Advertising Service: Statistical Data	4-3
4-2.	EOSView: Statistical Data	4-8
4-3.	Scientists' Workbench Statistical Data	4-11
4-4.	General: Statistical Data.....	4-14
5-1.	Advertising Service: Statistical Data	5-4
5-2.	EOSView: Statistical Data	5-8
5-3.	Scientists' Workbench: Statistical Data	5-11
5-5.	General: Statistical Data.....	5-14

Appendix A. Usability Test Tasks and Observations

Appendix B. Exit Survey Results

Appendix C. Survey Questions

Appendix D. Raw Survey Scores

Appendix E. Raw Free-Text Comments

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1. Introduction

1.1 Purpose

This paper describes the results of the Evaluation Package 4 evaluation. Two methods were used to evaluate EP4: usability testing and user survey. Descriptions for the implementation of usability tests for EP4 and the on-line user survey, known as the Interactive Evaluation Tool (IET), are provided. The data analyses for these two data collection methods are detailed. A list of Recommendations to Developers is included in this report. In addition, some comments generated from the EP4 evaluation were input to the User Recommendations Database (URDB); those entries are provided.

1.2 Organization

This paper is organized as follows:

Chapter 2 introduces the Evaluation Package 4 (EP4), usability testing, the Interactive Evaluation Tool (IET) and definitions of terminology used throughout the document. Chapter 3 provides information on the EP3 comments that were incorporated into EP4. Usability Testing methodology and the test results are detailed in Chapter 4, followed by the methodology and results of the IET Survey in Chapter 5. Chapter 6 summarizes the EP4 Evaluation and lists the EP4-related URDB entries, the Recommendations to Developers, and some general comments on the EP4 Evaluation experience. The Bibliography for the report is contained in Chapter 7 and is followed by the Appendices.

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2. Background

2.1 EP History

A multi-track development process has been adopted by the ECS Team to build the EOSDIS Core System (Percivall 1994)¹. This process includes the development of a portion of ECS on an incremental track and parallel development of the remainder of ECS on a formal track using the traditional waterfall development methodology. To accelerate and accommodate early user feedback a delivery mechanism called an Evaluation Package (EP), integrates early prototypes and incremental components. was devised.

Evaluation Packages also allow developers to evaluate the advertised capabilities of custom-off-the-shelf (COTS) software and hardware in the context of ECS. EP4 focused, in part, on establishing an interconnected environment is made up of ECS workstations at each DAAC and the ECS Development Facility in Landover, MD. The testbed environment is built upon Open System Foundation's (OSF) Distributed Communications Environment (DCE) (Dopplick and Percivall, 1994).

EP4 explores new concepts for the ECS Client based on the revised ECS architecture as presented at the ECS System Design Review in June 1994. In terms of the portions evaluated by users, EP4 focused on three areas (HAIS, 1995):

Scientists' Workbench - the desktop portion of the ECS Client that allows access to ECS applications and data. The prototype helps refine the users' requirements of the desktop application for installing and launching applications.

Advertising Service - built on a modified Mosaic interface, this application allows users to browse and search for data and service advertisements. This prototype helps refine the search, navigation, and interface requirements with the underlying communications software, the Trader Service.

EOSView - the tool that makes it possible for users to view HDF-EOS formatted data files. This software allows for display of HDF file structures, a pseudo color display window, and simple animations. HDF formatted data, provided by the DAACs, are available in EP4 for viewing and to demonstrate the capabilities of EOSView.

In addition, the EP4 allowed access to the enhanced User Requirements Data base (URDB) and ECS Data Handling Service (EDHS).

For a description of EP4 functional content and physical configuration, consult the following:

- EP4 Design Review Presentations (194-722-EP4-001)
- EP4 Deployment Description Document (222-TP-001-001)

¹ Please see Chapter 7 for References.

2.2 Evaluation Methods

EP4, the fourth in a series of Evaluation Prototypes, was released by ECS for evaluation on January 11, 1995, the Evaluation Period ran through March 6, 1995. EP4 was evaluated using two methods: Usability Testing and an Independent Evaluator Survey implemented as the Interactive Evaluation Tool (IET). The usability test was administered by the test Facilitator and Observers in a controlled environment that allowed for observed and measured user response for evaluation of design efficiency. The second evaluation method allowed evaluators to input their user preferences and suggestions to the IET, an on-line user survey in an independent, or uncontrolled environment.

These two methods were chosen in order to provide increased depth and breadth in the data collected during the evaluation period. Each method complements the other as each has its own strengths. The controlled environment of usability testing allows for test Facilitator to measure variables such as time to access the system, and control the order of user tasks and the amount of help provided. One of the most notable advantages of usability testing is that it enables the system developers to directly observe the way users use the system.

The Interactive Evaluation Tool collected information on user needs, preferences, and comments. This method of evaluation was designed so that Evaluators could access the EP4 at their own convenience, alleviating the requirements for a dedicated test environment, travel, etc. Another advantage was that the Evaluators were able to and encouraged to access EP4 a number of times during the Evaluation Period, recording any changes in opinion as their familiarity with EP4 increased. Comments recorded in the IET by the Independent Evaluators provided information on their perceptions of EP4 functions including Evaluator estimates of their ease of use and related system and design preferences.

The Evaluators were selected by NASA and were divided into two groups, the eight NASA Tirekickers and the over 60 Evaluators. All of the Tirekickers and Evaluators have experience in various disciplines of earth science research both as users and producers of data, as well as with the management of large datasets. None of the Evaluators or NASA Tirekickers were affiliated with Hughes, this was one of the primary criteria used by NASA for selection of Evaluators. A number of Hughes-affiliated personnel (DAAC liaisons, Science Office and Integration and Test personnel) evaluated EP4 and the scores they recorded in the IET were not used for statistical analysis. However, many of their comments offered suggestions for improvement and correlated those comments provided Evaluators.

2.3 Process for Incorporating Evaluation Results into ECS

The Usability Test Lead reviewed the Evaluators' comments and selected those which were appropriate for formal submission to ECS. These would include any potential new ECS requirements, implementation suggestions, recommendations for process improvement, and policy considerations. Suggestions will be entered by the Usability Test Lead into the User Recommendations Data base (URDB). This database is responsible for collecting and tracking user recommendations made to the ECS. A team of analysts researches each entry and ensures that they are forwarded to the correct person, be that a system designer, developer, policy maker, etc.

Information on all URDB entries related to EP4 will be available in the URDB and on the URDB Home Page. To find out more information about the URDB, how to log on to the URDB, the analysis process, and the URDB entries themselves please access the URDB Home Page at <http://epserver.gsfc.nasa.gov/urdb/urdb.html>

2.4 Key Terms Used in This Document

Usability Participants are those who represent, or who are in fact, potential end users of the ECS. They evaluated the EP4 through formal usability test sessions during which they were given defined tasks to accomplish in a certain order. The test sessions were conducted in a controlled environment. Data collected from these evaluators are in the form of observations made by the Observers and Facilitator during usability testing, in addition to Participant comments and survey responses as recorded in the IET.

Independent Evaluators are those who represent, or who are in fact, potential end users of the ECS. As opposed to evaluating the EP4 through usability testing they accessed EP4 at their own convenience, using their own resources, in an uncontrolled, or independent environment. The Independent Evaluators were selected by non-ECS personnel and have experience as Version 0 Tire kickers, User Services Working Group members, DAAC personnel, etc. With the exception of a brief descriptive pamphlet on EP4, these evaluators were not regulated, tasked, advised in how to proceed through the system, nor were their sessions timed. Data collected from these evaluators were in the form of written comments and survey responses as recorded in the IET.

Evaluation Period ran from January 11, 1995 to March 6, 1995. Usability testing was conducted within this time frame. Independent Evaluators were asked to access EP4 at least twice during this period.

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3. Incorporation of EP3 Comments in EP4

3.1 EP3 Comments: Top Level

The EP3 received a generally positive response from the EP3 evaluators; however, there were a number of suggestions for improvement. These suggestions were aggregated into ten top-level categories (in italics), published in the EP3 Evaluation Report (194-TP-441-001), and provided to the EP Developers. Results of how the EP4 Evaluators incorporated these suggestions will be discussed in the following chapters.

1) **Evaluators commented that better window management was needed for the EPs.** Because each function generated between 2 and 5 windows it became difficult for the user to manage the windows on their screens. Management was further complicated for those using monitors smaller than the 19" the EP3 was designed to be displayed upon. EP4 developers created a window management system in which users could choose whether or not they wanted to open a separate new window or have the new window "overwrite" the current window. In addition, the window sizes became modifiable so that no minimum monitor size was required to access the EP4.

2) **Continual indications of system activity is a must.** Evaluators commented that the system must return some indication to the user that the system is working. This was especially needed for system intensive functions or during periods of slow response time. Examples such as an hourglass, stopwatch, or "please wait..." were suggested as indicators of system activity. EP4 developers were able to provide system indicators within applications, for example, when EOSView loads imagery an hourglass symbol appears in place of the mouse cursor and a notification as to the system activity "loading images..." is provided.

3) **Mocked-up context-sensitive help illustrates its potential - must flesh it out to a robust on-line capability.** Within EP4 context-sensitive on-line help was available for each application and for the Scientists' Workbench. Help information was provided using a Mosaic interface.

4) **The on-line survey (IET) was very successful - especially the free-text capability.** Changes were made to the on-line survey to improve its ease of use. The survey scale, which was previously 1 (strongly disagree) to 9 (strongly agree) was reduced to a scale of 1-5 for EP4. In addition, the survey questions were grouped by function (EOSView, Workbench, etc.) so that Evaluators did not have to scroll through the entire survey form.

5) EP3 Evaluators commented that **search methods should be made more intuitive.** Developers incorporated the Advertising Service, an application using a modified Mosaic interface to make searching for data and services more intuitive. EP users comfortable with World Wide Web browsers such as Mosaic or Netscape would find the search methodology of the EP4 Advertising Service familiar.

6) Related to searching, EP3 Evaluators requested that **"dependent valids" be implemented in the search criteria definition process.** The decision to use a modified Mosaic interface as the

basis for the EP4 search tool resulted in the inability to implement this EP3 suggestion. However, part of the role of the Advertising Service prototype was to gather feedback on whether or not ECS users would accept that sort of compromise.

7) Evaluators commented that although the **User Interface design is on the right track, it should be implemented using a coordinated style guide.** Since the publication of the EP3 Evaluation Results report and the subsequent change in ECS architecture many of the user interface issues commented on in EP3 have become obsolete. Developers wrote the EP4 following the ECS Style Guide as much as was possible. They encountered some issues that are not addressed in the Style Guide, namely incorporation of diverse applications that do not lend themselves easily towards user interface standardization.

8) and 9) Analysis of EP3 comments revealed that Evaluators thought that **users would like to be able to enter their name, preferences for interface “look and feel,” level of expertise, data search and retrieval preferences and the system should remember them.** These capabilities were not prototyped in EP4; they will be prototyped in a future Evaluation Package.

10) Although this comment was not gathered through EP3 Evaluation, one of the lessons learned by the EP3 Team was **Usability Testing has proven useful and should be more broadly applied in the future.** Because of this the plan to test EP4 for usability was incorporated into the EP4 Evaluation Plan from the start, the EP4 Design Review.

3.2 EP3-Related URDB Entry

During the analysis of the EP3 IET survey and usability test comments one recommendation stood out as a potential new ECS requirement. This recommendation, listed below, requested a new capability for EOSView. It was entered into the User Recommendations Data base (URDB), a means of formally submitting recommendations to ECS. The URDB Analysis Team has researched the entry and submitted it to an ECS Screening Team for review. Following this initial review it will be forwarded on to the Technical Assessment Panel for a cost and schedule impact assessment. If it is accepted by ECS as a new requirement it will be sent to NASA for review and approval.

URDB_ID: 732

AREA OF CONCERN: EP3 Evaluation

SUMMARY: Would like to animate movie loop while zoomed

RECOMMENDATION DETAILS: During the evaluation of EP3 an evaluator remarked that they would like to animate a movie loop, stop the movie, zoom in on a portion of the image, then re-start the animation while the imagery is zoomed.

4. Usability Test Results

4.1 Test Design and Methodology

The methodology employed for usability testing of EP4 was adapted from a paper written by Martha Szczur, "Usability Testing on a Budget" (1993). Szczur describes an efficient and low cost method of testing and quantifying usability.

Usability test Participants were selected from the list of EP4 Tire kickers, ESDIS personnel, and from the group of scientists who volunteered to participate in testing when they came to Landover, MD for the Project Design Review (PDR) in January and February 1995. In all, 15 people participated in usability test sessions.

In addition to the test Participants, a number of other personnel were involved in each test session. Depending upon the number of Participants, one or two Observers were employed to take notes on Participant reactions, comments, and body language. Each test session was conducted by the Facilitator, who acted as the host to the Participants and kept time for the test session. The records kept by the Observers and the Facilitator were combined with comments and survey scores recorded by Participants in the IET and used for analysis. Figure 4-1 shows the Usability Test Environment as employed for EP4.

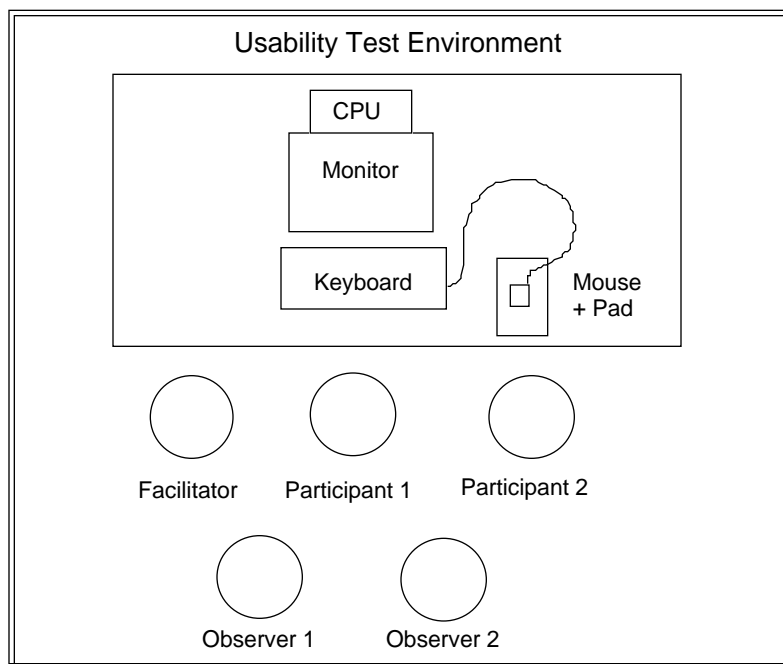


Figure 4-1. Usability Test Environment

Test sessions were conducted in a conference room dedicated to EP4 usability testing, in some cases test sessions were conducted in the Landover computer demonstration room. Each session was divided into three parts. The first portion of the session consisted of introductions between Participants and Observers and a demonstration of EP4. The Facilitator acted as host for each session and made introductions and also gave the demonstration of EP4 to the Participants. Next the Participants were given a packet of tasks to complete using EP4. Finally, Participants were asked to fill out the usability test “Exit Survey.” See Figure 4-2 below.

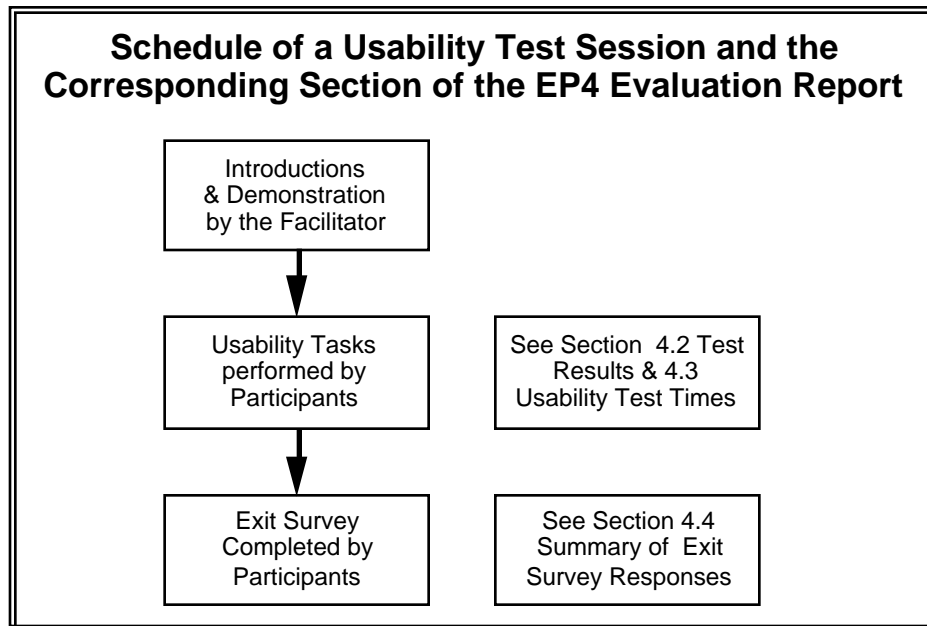


Figure 4-2. Schedule of a Usability Test Session and the Corresponding Section of the EP4 Evaluation Report

4.2 Test Results

4.2.1 Advertising Service

Usability Test Participants' Comments from the IET

The final usability test task asked the Usability Test Participants to answer the questions in the Interactive Evaluation Tool (IET). Participants were asked to fill out the IET survey so that their responses could be compared to the scores and comments given by Independent Evaluators (discussed in Chapter 5). The IET contained eight questions about the Advertising Service. The question scale ranged from 1 (strongly disagree) to 5 (strongly agree), a score of 3 corresponded to neutral or no opinion. The Advertising Service section of the IET received a broad range of scores (Table 4-1).

Most of the Participants thought it was easy to navigate through various levels of the Advertising Service (Question 1). This is likely due to the fact that all of the Participants were very familiar with WWW Browsers such as Mosaic and Netscape. Participants also agreed that the ability to

search for advertisements using Mosaic is an important part of the Advertising Service (Question 5). One interesting point to note is that while Participants agreed that it was easy to construct a query for advertised services (Question 4), many Participants had to ask for an explanation of the question before answering it. Either the Participants did not remember making a series of queries during the usability tasks or did not consider the tasks performed to be queries.

Participants did not like the multiple methods provided for locating services and data in the Advertising Service (Question 2). Only four of the nine Participants responded to this question and all of the comments fell in the neutral to negative range. This might not have been an appropriate question to ask the Participants who had used the EP4 for less than one hour, they were not familiar with all items mentioned in the question. Thus it is understandable that Participants did not agree that providing multiple methods of locating services and data are useful (Question 3).

Participants agreed that enough information was provided in the Advertising Service for them to determine if service icons found should be installed on their Workbench (Question 6). Comments they made during usability testing confirm this, however, they were not necessarily pleased with the organization of the data provided. For the most part the test Participants agreed, but not strongly, that it was easy to install Advertising Service icons on the Workbench (Question 7). Their comments during the test session about use of the middle button and the need for a feedback indicator offer insight as to why the survey score is low. Participants were evenly divided on the issue of whether the Advertising Service is easy to use (Question 8). Because of the 50-50 split in responses the average score on the ease of use was a neutral 2.9.

Table 4-1. Advertising Service: Statistical Data

Questions: Advertising Service Scale = 1 (strongly disagree) - 5 (strongly agree)	Average Score	Standard Deviation	Number of Responses	Minimum Score	Maximum Score
1. Navigation through various levels of the Advertising Service was easy	4.6	0.9	5	3	5
2. I like the multiple methods (hypertext, text search, and attribute search) provided for locating services and data in the Advertising Service.	2.3	1.0	4	1	3
3. Providing multiple methods of locating services and related data is useful.	2.8	1.7	4	1	5
4. It was easy to construct a query for advertised services	4.0	1.0	5	3	5
5. The ability to search for advertisements with Mosaic, is an important aspect of the Advertising Service.	4.0	0.8	8	3	5
6. The Advertising Service provided enough information for me to determine which services I should install on my Workbench.	4.1	0.6	8	3	5
7. The method used to install new services from the Advertising Service to the Workbench is easy to use.	3.8	1.3	8	1	5
8. The Advertising Service is easy to use.	2.9	1.6	7	1	5

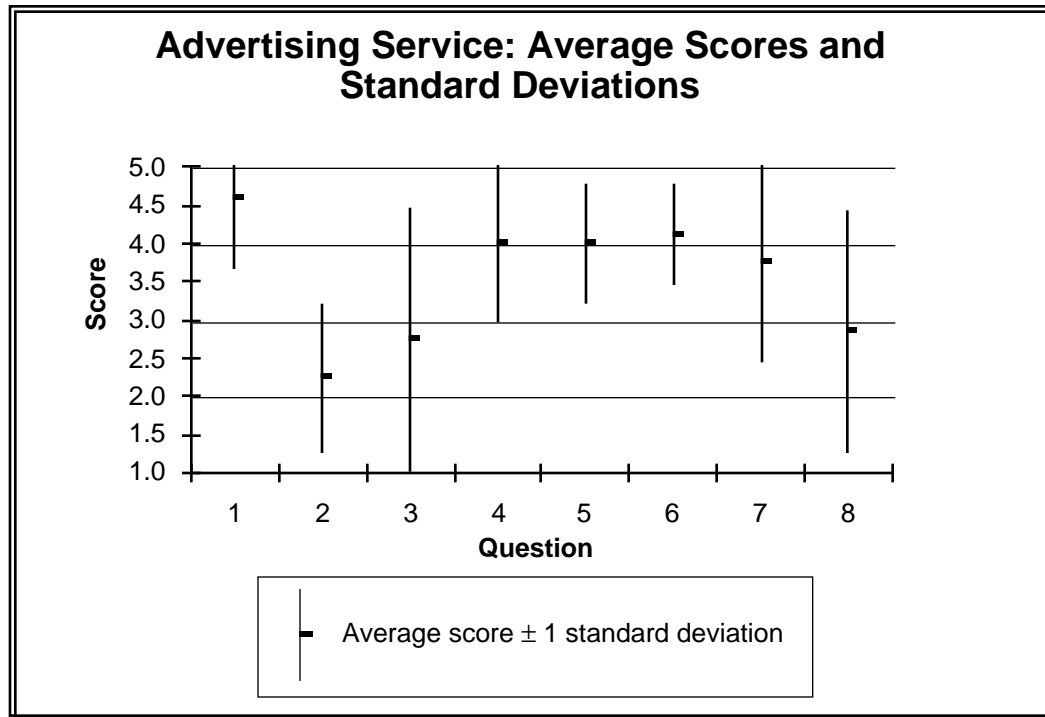


Figure 4-3. Advertising Service: Average Scores and Standard Deviations

Analysis of Observations and Usability Test Participants' Comments

The usability test Participants were asked to complete two tasks that involved navigating through the Advertising Service to locate subsetting services and information on the provider of those subset services. In order to complete the tasks Participants had to navigate through the Advertising Service using the hyperlinks, find the correct services and their related icons, drag and drop these icons into a folder they had already created on the Workbench, and get information on the service provider for the previously collected service icons.

Some comments suggested that the **Advertising Service paradigm** was not completely understood by the Participants. A number of users were not sure *who* the Advertising Service was for. When asked to clarify their comments many said in effect, “Well I wouldn’t look in the Advertising Service unless I had something to advertise.” Another Participant thought that the Adv_Service icon represented “Advice Service.” It is obvious that the complete name of the Advertising Service must be spelled out to prevent user confusion. Participants suggested that the name be changed to better reflect its role as a “Data and Information Search” or “Data Sets and Other Products.”

While most of the Participants were familiar with WWW browsers such as Netscape and Mosaic it was noted by one Participant that some basic instructions should be provided on the Advertising Service Home Page, and more detailed instructions within the on-line Help.

Those familiar with the capabilities of Mosaic and Netscape thought that the Advertising Service should contain many of these same, or modified **capabilities**. The most requested capability was an “abort” button of some kind that would allow the user to stop a search if it took too long. Users also requested a hot list, or list of previous screens (such as “Navigate” in Netscape) be included in the Advertising Service. These capabilities will become especially useful as the Advertising Service becomes more complex as it is populated with more services.

Participants requested the search form “remember” the previously entered search criteria, a feature available in Mosaic. If the requested capability was available in the Advertising Service, searches would be more efficient. It would allow researchers to make multiple searches, each time changing only one search criteria and leaving the others the same. Other requests included that the URLs be displayed to the user. Also as links are used their color change so that users know that they’ve already linked to that page. On the whole, Participants liked having the service icons returned at the bottom of a screen after the search was complete.

There were a few comments on the **drag and drop** feature. They dealt primarily with the users’ confusion over using the left-most mouse button for all EP4 actions except for drag and drop which requires the use of the middle mouse button. However, once the Participants learned which button to use they were quick to adapt. This is the only application in EP4 that uses the middle mouse button, some commented that this was inconsistent with the rest of EP4.

On a related note, Participants did not like that icons could only be installed on the “top” or current directory, in other words, not into a folder sitting within that directory. It was suggested by many Participants that drag and drop might be easier to use if there was some indication or feedback that the icon installation was effective. Participants suggested that the folder become shaded as the cursor moves over it, to indicate it is the “target folder,” as implemented in the Macintosh operating system.

Some of the Participants were looking for features and capabilities in the Advertising Service that are not prototyped. These capabilities included a link to **Version 0** and to EDC’s **GLIS**. A number of Participants were disappointed that they couldn’t connect to GLIS, especially because it had been mentioned in a number of pages dealing with EDC datasets. In addition, users were interested in being able to **enter geographic search criteria by drawing a polygon** on a data selection map. Some Participants had expected that capability to reside within the Advertising Service.

The majority of comments focused on the **content and wording of text** provided throughout the Advertising Service and on the data/service hierarchy of the Service itself. Most Participants found some passages of text confusing, especially the lengthy passages, as is the case on the Home Page. Users suggested that areas of text be highlighted in some way (perhaps using different fonts, emboldened text, or including an illustrative image) to call attention to the important information. Text could be re-organized so that the more detailed information could be placed under link within a more general discussion of that topic. In other cases, the titles of links and text were confusing, for example, the differences between “Earth Science Data and Related Services” or “Services and Related Earth Science Data.”

Users liked having the ability to browse through the Advertising Service, especially because it allows for a **non-hierarchical search**. Some raised the issue of what will the Advertising Search look like when there are hundreds of services advertised? Will the Advertising Service be able to handle the load?

The **data and services structure** within the Advertising Service was confusing to Participants. When Participants came upon a screen that listed various advertised services they were organized by data level, i.e., ECS, EOSDIS, Other, and General, user reaction was along the lines of “I have no idea what level Landsat falls under, moreover, I don’t care.” There were many other places within the Advertising Service where the data and services are listed by level, Participants found this a confusing and inefficient organization. They suggested the information be organized by service type: Subset, Search, Browse, Transform, etc. rather than by where the service comes from (EDC, GSFC, etc.).

The **Search/Subset Services forms** confused some of the usability test Participants. It was not clear to the users just how many parameters must be filled out on the search forms for the Advertising Service to execute a search. Some of the search criteria shown were not preferred by Participants. The most striking example was, “Its a bit frightening to have the search language come up as a search criteria!”, this is information that most users do not need and would not understand in this context. If a parameter is not necessary, or cannot be changed by the user then it should be removed or moved to the bottom of the page with an explanatory note.

The **Advertising Service “Look and Feel”** was commented upon. Most everyone liked the icons, and the Advertising Service logo “Next Link.” The windows were re-sizable which was a plus. To improve the interface, making the text more readable by using different font sizes and shortening the passages would help. Aligning data entry fields in the search forms would make the form itself easier to fill in and submit. On the whole, Participants thought that the Advertising Service has real promise.

4.2.2 EOSView

Usability Test Participants’ Comments from the IET

There were ten questions on the Interactive Evaluation Tool survey related to the EOSView application. Of the four sections within the IET, EOSView received consistently high scores for each question. It should be noted that this section of the survey received, on average, the fewest number of responses for each question. Because of this, the scores may not be statistically significant.

EOSView received its highest scores on questions relating to Help and functionality. Participants strongly agreed with the survey statement “Help information/instructions provided for EOSView are understandable” (average score of 4.4 out of 5.0) (Question 7). In addition, Participants agreed that the functionality provided in EOSView was adequate for their needs and uses (Question 9). It is encouraging to note that all of the Participants who answered these questions were in close agreement with one another.

However, when asked if they agreed that panning and zooming of images is easy in EOSView (Question 3) only three Participants responded, two of them giving scores of “no opinion.” Based on comments provided during usability test sessions most users seemed to like the features but providing a label on the panning window would greatly improve its ease of use. Participants agreed that the ability to change color palettes is useful (Question 4), but many commented during the test sessions that they would like a scale provided on the color bar, the ability to create their own palettes, etc. Their desire for increased functionality in this area may have been the cause for a slightly positive average score of 3.6 out of 5.0.

Participants were divided on their response to the question, “The EOSView animation capability is useful” (Question 5). The average score was slightly positive at 3.5 out of 5.0, however, a standard deviation of 1.3 indicates that none of the respondents agreed with each other. A related question asked the Participants to rate the adequacy of the EOSView animation speed (Question 6). For the most part, users agreed that the speed was adequate giving an average score of 3.8 out of 5.0.

When asked whether they agreed with the statement, “the EOSView HDF file window displays the file’s structure clearly” (Question 1), the Participants rated this with an average score of 3.8 out of 5.0. Only four out of nine Participants rated this question; it is not known if the ambiguous wording of the question is to blame for the low response rate. Question 2 asked the Participants to rate the ease with which they were able to select and view individual images. The five Participants who responded gave it an average rating of 3.6 out of 5.0 but the large standard deviation of 1.7 indicates that there were a wide range of scores and little agreement among Participants.

A wide variety of Participant response was evident in the scores received by question 8, “The EOSView window layouts are easy to understand.” During usability test sessions every single Participant commented on the window layouts. In general their response was positive rating the question with an average score of 3.7 out of 5.0, however, the standard deviation of 1.5 indicates that there are a wide variety of user needs and opinions to be accommodated by this application. Participants were asked whether they agreed or disagreed with the statement, “Overall, I found EOSView easy to use” (Question 10). This question received a rating of 3.8 out of 5.0, a positive score on the whole.

Table 4-2. EOSView: Statistical Data

Questions: EOSView Scale = 1 (strongly disagree) - 5 (strongly agree)	Average Score	Standard Deviation	Number of Responses	Minimum Score	Maximum Score
1. The EOSView HDF file window displays the file's structure clearly.	3.8	1.0	4	3	5
2. It is easy to select individual components (raster images and scientific data groups) of HDF files and view them as pseudo color images in EOSView.	3.6	1.7	5	1	5
3. Panning and Zooming of pseudo color images in EOSView is easy.	3.3	0.6	3	3	4
4. The ability to select different color palettes for the pseudo color image display was useful.	3.6	0.9	5	2	4
5. The EOSView animation capability is useful.	3.5	1.3	4	2	5
6. The speed of EOSView animation was adequate.	3.8	1.1	5	2	5
7. Help information/instructions provided for EOSView are understandable.	4.4	0.5	7	4	5
8. The EOSView window layouts are easy to understand.	3.7	1.5	6	1	5
9. The functionality (animation, panning, zooming, etc.) provided in EOSView is adequate for my needs/uses.	4.3	0.5	7	4	5
10. Overall, I found EOSView easy to use.	3.8	1.0	6	2	5

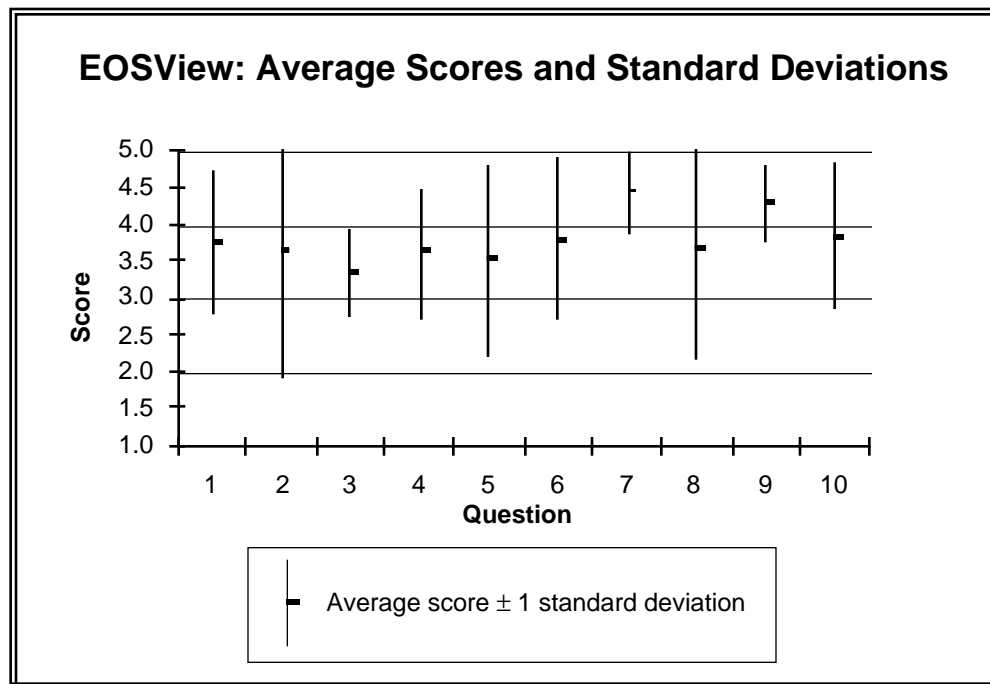


Figure 4-4. EOSView: Average Scores and Standard Deviations

Analysis of Observations and Usability Test Participants' Comments

The usability test contained three tasks for Participants to explore the workings of EOSView. Participants were asked to find the correct image file using two different methods, open the file structure window (it lists the contents of the HDF file), view a single image, zoom and pan around the image, change color palettes, animate an image file, change the mode of the animation and the animation speed. On the whole Participants seemed quite pleased with the viewing and animation capabilities of EOSView. Many of the comments made by Participants mention significant EOSView “look and feel” issues.

Participants liked the multiple ways to start EOSView, for example, the drag and drop and the use of double-clicking the image file icon. However, once the **contents of the image file** were displayed in the “file structure window” the Participants oftentimes became confused. It was not clear to Participants that the “+ Raster Image Group (306/200) “ was an image and, if double-clicked on, the image would be displayed. Participants suggested highlighting the text to make it appear to be “click able” this would give users a visual clue as to what to do, similar to hyperlinks in the Advertising Service.

Some Participants questioned the importance of giving this **file structure information** to the user. Comments such as “Will someone who uses HDF know what this means?” and “Do I need to know this?” were often heard. Participants asked if the rather cryptic “+ Raster Image Group (nnn/nnn)” information could be changed to something more meaningful to the user, such as an image frame name (“+ AVHRR Band 1 day 321, + AVHRR Band 1 day 322”).

The **zoom buttons** elicited a number of comments. Some thought that the text on the buttons should be changed from “ZOOM +” to “ZOOM In.” While it did not occur in any of the usability test sessions, some Independent Evaluators recorded comments in the IET saying that the zoom buttons on their machines were displayed as “OOM +” and “OOM -.” This was not repeatable in Landover. Participants commented that it would be better to have the “Zoom Factor” displayed near the zoom buttons, rather than in the bottom corner of the EOSView window.

Participants liked the **panning window** but some mentioned that they would not have known how to pan unless they had seen the demonstration at the beginning of the usability test session. Many suggested the addition of a label to the window to clarify its purpose to new users. A significant number of Participants noticed that the panning window is not “what you see is what you get,” meaning, the cursor in the panning window does not consistently correspond to the center, or any other part of the viewing window. In conjunction with the panning window, users would like to see a display of the image pixel x,y coordinates, as the cursor moves across the image; other parameters requested were digital number value and geographic coordinates.

The most common complaint from users about the **image palettes** was that they lacked an associated color scale. Knowing the scale is crucial to the interpretation of image data, therefore without a scale EOSView may not be very useful for viewing some image data. Many Participants requested that users be able to create their own, or insert their custom image palettes into EOSView. Others would like the color bar, displayed on the EOSView window, to be movable.

Participants liked the EOSView **animation capabilities**. Because of the variation in system response users suggested that an “abort” or “escape” key be available in EOSView to cancel image loading or animating commands that take an inordinately long time to execute. Although a feedback message is provided to the user during image loading and animating it might be better if the message were larger or more prominent. Many Participants did not see the feedback messages provided and therefore kept clicking the mouse and thus increasing system load.

Other **requested animation capabilities** were “customized movie loops” where the user would be able to select the order and number of the images to be looped. Along the same lines, one Participant suggested that it would be easier for the user to create an animation by placing all the image files within one folder and then animating the entire folder by highlighting it. This comment came up during a discussion of using scripts to create custom movie loops. The Participant’s fear was that if it took too long to create a movie using scripts the user might be better off creating an MPEG file instead.

Although there were a large number of comments about the EOSView Participants seemed quite pleased with it. The most requested capability was that EOSView provide users with a **means to view metadata**, all who commented said this is a critical capability. Without easy access to metadata in conjunction with the data viewing capability, data browsing and ordering become difficult. This feature is available in a package called “Browse-a-rama” on Mosaic.

The mission of EOSView as an HDF viewing tool was not clear to some users. One remote sensing scientist commented, “... a major issue is, to what extent EOSView should incorporate image processing/analysis capability?” Others requested items such as a geographic reference map, an image centering or focus point capability.

4.2.3 Scientists’ Workbench

Usability Test Participants’ Comments from the IET

There were four questions in the Interactive Evaluation Tool that Participants were asked to answer during their usability test session. Participants strongly agreed with the statement, “It is easy to create new directories and move files around to organize the Workbench to suit my needs.” The Participants gave this question a strong positive rating of 4.2 out of 5.0 in the IET survey. However, during observations of usability test sessions it was clear that Participants found it easy to create new directories but very difficult to move folders and files within the Workbench.

Participants were asked if they agreed with the statement “It is easy to invoke EP4 functions from the Workbench” and they responded with an average score of 3.2 out of 5.0. Respondents to this question fell into two camps, the four who thought it easy and gave a positive score and the two who did not think it was easy and gave negative scores. The majority of respondents agreed with the statement, “It is easy to start functions using the ‘drag and drop’ feature.” This score should be examined carefully, this EP4 capability was not part of the usability test and only a handful of Participants were aware of it. It is possible that as they were reading the question they confused it with the use of drag and drop to *install* icons from the Advertising Service to the Workbench.

Participants also agreed with the statement, “The Workbench layout is easy to understand” and rated this positively with a score of 3.7 out of 5.0. While Participants may have agreed with the statement, they also made a number of comments about the use of acronyms in the pull-down menus, the context-sensitive commands under the “Action” pull-down menu, and suggestions about additional file manager capabilities. Details of these comments are available later in this section.

Table 4-3. Scientists’ Workbench Statistical Data

Questions: Scientists’ Workbench Scale = 1 (strongly disagree) - 5 (strongly agree)	Average Score	Standard Deviation	Number of Responses	Minimum Score	Maximum Score
1. It is easy to invoke EP4 functions from the Workbench.	3.2	1.3	6	1	4
2. It is easy to start functions using the ‘drag and drop’ feature.	3.5	1.4	6	2	5
3. It is easy to create new directories and move files around to organize the Workbench to suit my needs.	4.2	1.0	6	3	5
4. The Workbench layout is easy to understand.	3.7	0.8	6	3	5

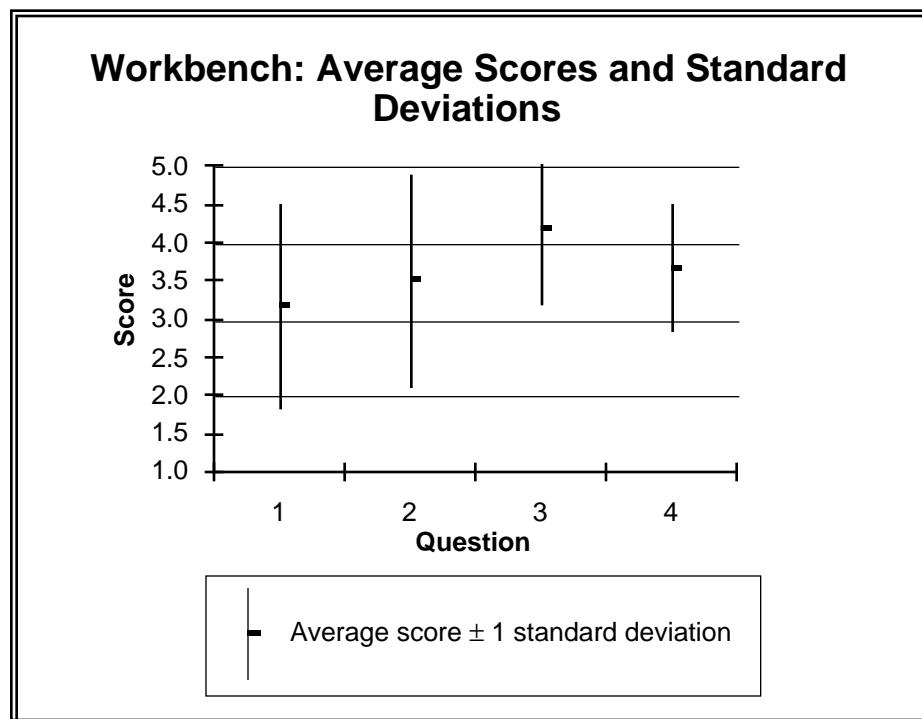


Figure 4-5. Workbench: Average Survey Scores and Standard Deviations

Analysis of Observations and Usability Test Participants' Comments

There was one usability task specifically related to the Scientists' Workbench, however, each of the eight other tasks required some use of the Workbench. The Workbench related task asked the Participant to open up a folder, create a new directory within that folder, move image files into the new folder, return to the previous level of the Workbench and create a new folder for use later in the usability session. Most of the Workbench related comments dealt with the ability to move icons on the Workbench, the Workbench file structure, and the pull-down menus.

Many Participants liked that files and applications could be opened using a double-click. Also, commands such as creating a new directory could be confirmed with a carriage return and by clicking on the dialog box "OK." This was very similar to the way the Macintosh operating system works, among others. Because of that similarity Participants may have been looking for the Workbench to more closely resemble a Macintosh interface. An example of this is that a significant number of users tried and were disappointed that it was not possible to highlight multiple icons and move them into a folder simultaneously. In addition, some Participants were annoyed that they could not place icons in their desired position within a folder. Many Macintosh users place files within a folder according to frequency of use, others view their files and folders by name, by date, by size, etc. A number of usability Participants wanted the same sort **flexibility in terms of file management** in the Scientists' Workbench. Related to this was the users' desire for Workbench and application control keys, this would allow users to move through folders, files, and applications quickly.

By far the most confusing aspect of navigating through the Workbench was the icon used to return to the previous level of the Workbench. This **"Go Back" icon** was not clear to any of the 15 Usability Participants. Only one of the Participants, after being told how to return to the next level by the Facilitator, understood that the "." text below the icon is the UNIX command to return the parent directory one level above the current working directory. Even though the label accurately represents the action taken by the icon, it should be re-labeled "Return" or "Back" to accommodate users who do not know UNIX. When more than one Workbench window was open Participants noted that the **window name** on each window was the same, "ECS Workbench." They had expected each window to be renamed or numbered as they were opened, "Workbench_1," "Workbench_2," etc. The multiple windows made the task of closing the windows difficult because of user confusion between the "close" and "exit" pull-down commands. Users may have an easier time of this if the warning message read "Close Workbench_3? Yes. Cancel. Help."

Related to this is the **path/directory information** available beneath the pull-down menu on each Workbench window. This line is the only source of information the user has about the location of EP4 data, applications, and services stored within his account. Even though the information is important, the Participants in the usability tests did not notice the information nor did they know how to use it. More thought should be given on how to use this information to the benefit of the user, perhaps it could be used as the window name, or could be editable and used instead of a "Go Back" button.

EP3 Evaluators requested that EP **window management** be improved. Therefore EP4 was designed such that users were allowed to decide if they wanted to open a folder as a new window

or open the folder “in place,” re-drawing the previous folder with the contents of the newly opened folder. Participants liked the option but would have preferred to set the default to “OpenNewWindow.” Some said that they didn’t mind what the default was set to as long as a) they were aware of the differences in settings and b) they would be able to change and save the default to a user-defined preference.

The **Workbench pull-down** menu elicited a number of comments on everything from placement of commands to what the commands were labeled. By far the most common comment was that acronyms should not be used, these were specifically geared to the RRDB (URDB) and EDHS acronyms listed under the “Tools” menu. Many of the ECS users will not know what these acronyms stand for, they should be re-named on the interface to clarify their missions, perhaps as “ECS Suggestion Box” and “ECS Home Page.” It was also suggested that all of the commands (OpenNewWindow, OpenInPlace, Execute) be shown under the “Action” pull-down menu, but should be grayed out unless they are appropriate to the application or folder highlighted. Participants did not think it should ever be empty, as is the case when nothing on the workbench has been highlighted, this is inconsistent with the rest of the pull-down menus.

In general, most Participants seemed pleased with the Scientists’ Workbench as a paradigm and as a prototype. Most comments to improve the Workbench lean towards making the interface resemble that of a Macintosh. However, there were some Participants who suggested that the **Workbench would be better if it were more like the Mosaic interface**. This suggestion is not that surprising to hear, because it would bring the Workbench interface closer to those used by the Advertising Service, the Help, the URDB, and EDHS. It would make the ECS more internally consistent.

4.3.4 General

Usability Test Participants’ Comments from the IET

The Interactive Evaluation Tool contained five questions dealing with the overall, or more general aspects of the EP4. There was a broad range of responses to the statement, “Navigation through EP4 is easy.” Although the average response to the statement was 3.2 out of 5.0, the standard deviation confirms that Participants were not in agreement with one another. Responses ranged from a low of 2 to a high of 5, this indicates that a significant portion of the Participant population did not think that EP4 was easy to use. Similarly, Participants did not give a significantly positive rating to the ease with which EP4 window layouts could be understood. In fact, many of the Participants indicated that they had no opinion or were neutral about the question. Scores given to this question had a narrower range (between 2 and 4) but again indicate that it is hard to please everyone all of the time. Comments made by Participants during usability test sessions strengthen this interpretation.

Participants were slightly positive about the statement, “I like the way the EP4 Help function is implemented,” they rated it a score of 3.4 out of 5.0. In many cases Participants mentioned they liked the use of Mosaic as the Help interface. However, Participants were most neutral about their opinion on the instructiveness of the Help provided in EP4. Many of the Participants did not open any of the EP4 Help functions and therefore declined to respond to the question. This

questions received an average score of 3.0 with the lowest standard deviation of all General category questions, 0.6. The highest rated statement was that of “my experience using EP4 was positive.” An average score of 3.6 out of 5.0 was given by Participants, this score is supported by comments made by Participants at the close of test sessions, many of them asked to participate in usability testing of future EPs.

Table 4-4. General: Statistical Data

Questions: General Scale = 1 (strongly disagree) - 5 (strongly agree)	Average Score	Standard Deviation	Number of Responses	Minimum Score	Maximum Score
1. Navigation through EP4 is easy.	3.2	1.1	9	2	5
2. The EP4 window layouts are easy to understand.	3.3	0.7	8	2	4
3. I like the way the EP4 Help function is implemented.	3.4	0.8	7	2	4
4. The help information provided for EP4 is instructive.	3.0	0.6	6	2	4
5. My experience using EP4 was positive.	3.6	1.0	7	2	5

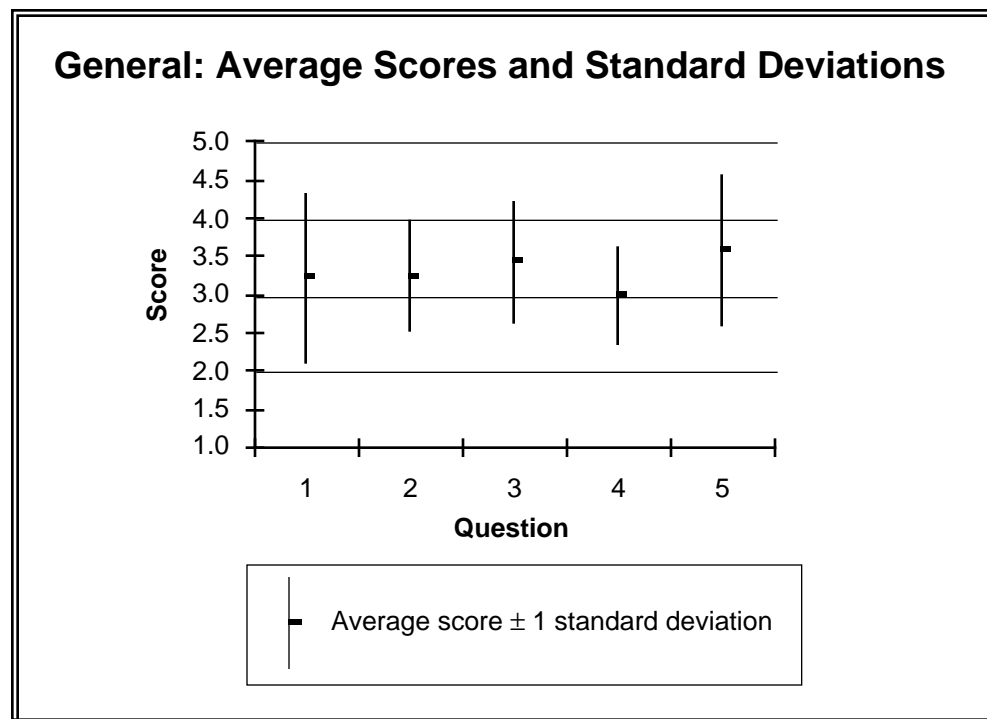


Figure 4-6. General: Average Survey Scores and Standard Deviations

Analysis of Observations and Usability Test Participants' Comments

The comments assigned to the General category are those which relate to EP4 overall, EP4 Help, and the Interactive Evaluation Tool (IET). Many Participants offered suggestions on ways to improve the Help and the IET, as well as offering suggestions of data, capabilities, and designs to include in the next EP.

Comments on **EP4 consistency** were raised by most of the Participants. The differences between the Help (prototyped using Mosaic) and the Advertising Service (prototyped using a modified Mosaic interface) were noted by Participants. At issue were the locations of buttons on these interfaces, specifically the different ways of closing windows; the inconsistencies within the Advertising Service generated the most comments. Participants noted inconsistencies in terms of the number of mouse clicks required to activate an application, connect to a hyperlink, or open a folder. Some actions required double-clicks: activating an application, opening a folder InPlace, activating EOSView by double-clicking an image icon. Other actions required single clicks: opening a folder on the Workbench as a NewWindow, navigating through the Advertising Service and the Help. One Participant was concerned about the integration of COTS packages into the ECS, each package with a different HCI, and how this would affect ECS consistency.

Participants had some suggestions about **how to improve the Help** provided by ECS. Help needs to be written from the users' perspective. A glossary of EOSDIS project acronyms should be included in a glossary or a hyperlink, a Participant mentioned EPs could incorporate a digital version of the acronym list distributed during PDR (Dec 1994 - Feb 1995). It was also suggested that the Help be made more visual, pictures, icons, colors, and different fonts should be incorporated to highlight information. One recommendation was to include a screen grab of various screens within each application and annotate them with arrows and titles that would be discussed in detail within the text of the Help.

There were a few comments on the overall **"Look and Feel" of EP4**. It was suggested that the developers look into fonts that are "safer" to port to different platforms. These fonts provide better size consistency between platforms than others. Participants would have liked the ability to change font size within EP4. A number of Participants commented on the information provided on the scrolling window within the log-in screen. They would have preferred the information be provided somewhere else within EP4 and that the log-in screen focus on the log-in to the system. If the information were provided elsewhere it could incorporate pictures or symbols within the text to highlight important user information. Although the icons received very few comments one Participant thought that they could be used a bit more creatively, for example they could be color coded to represent cost, volume, sensor, etc.

Participants also suggested improvements for the **Interactive Evaluation Tool (IET)**. They would like it incorporated into future EPs and the eventual ECS, it should include a button to directly link users to the User Recommendations Data base (URDB). Other improvements include labeling the Free-Text comment box at the base of the IET as "Comments." Many suggested using a scroll bar for users to move through each section of the survey because many Participants did not notice the "Next Page" button at the base of each survey section. The most common suggestion was to have a feedback indicator that the users comments were saved to the

database. Many Participants ended up saving their comments a number of times at the end of each session because they were not sure if the comments were stored the first time. Finally, Participants liked that the window could be re-sized but thought there might be ways to improve the look of the window as it is re-sized. In some cases the questions “disappeared” after the window was re-sized; this shouldn’t be allowed to happen.

Recommendations for the **capabilities to prototype in the next EPs** included a user history log and user preferences file. A number of Participants who use remotely sensed data on a daily basis thought it would be a good idea to prototype what tabular data will look like in the ECS.

4.3 Usability Test Times

Task performance times are used to quantify user satisfaction with ease of access and interaction with the system and with the speed of system response. One usability testing reference states that the average length of time it takes an Expert to complete each task may be multiplied by six to give the range of “acceptable time per task” for a Novice (Szczur, 1993). This acceptable range is compared to the times per task of the Novice Participants to determine the ease with which they are able to access and use the system. If a significant percentage of the Novice Participants are unable to complete a task within the acceptable range then that function or feature must be examined and possibly re-designed.

EP4 Experts were defined as those who had more than one month of experience using EP4. All of the EP4 Novice Participants had less than one day’s worth of experience with EP4. As anticipated, Novice Participants took longer to complete each task, oftentimes because they would investigate areas of each EP4 function that was of interest to them. They were encouraged to comment aloud as they explored the EP4 features, windows, and screens. These explorations provided the valuable feedback discussed earlier. The feedback gained from the Test Participants was deemed by the Facilitator, to be more valuable to the EP4 evaluation than the time per task data.

Figure 4-7 shows the total time it took to for each Participant(s) to compete each usability test task. It should be noted that even though a significant amount of “talk time” is included in the task performance times, the ratio of 1:6 Expert to Novice completion time has been met. This is more clear in figure 4-8 which shows the average Expert and Novice Participant task completion times and the Expert time times six for comparison. Each task was, on average, completed by Novices within six times the Expert time for the same task.

The Usability Test tasks in order are:

<u>Task Number</u>	<u>Task Description</u>
1	Read information on welcome screen and log in to EP4
2	Open new windows, create new folders, move files into folders.
3	Search for Landsat Subset Services on the Advertising Service and store icons in folders created in Task 2

- 4 Using Advertising Service, find EDC Landsat contact information.
- 5 Using EOSView open an HDF file and display the structure of the file.
- 6 Using EOSView, display an image from the file opened in Task 6, change the color palette, zoom in and pan around the image.
- 7 Select another HDF file and animate the imagery.
- 8 Connect to the RRDB (URDB) and find out how many URDB entries contain the keyword, EP.
- 9 Enter your comments in the User Survey (IET).

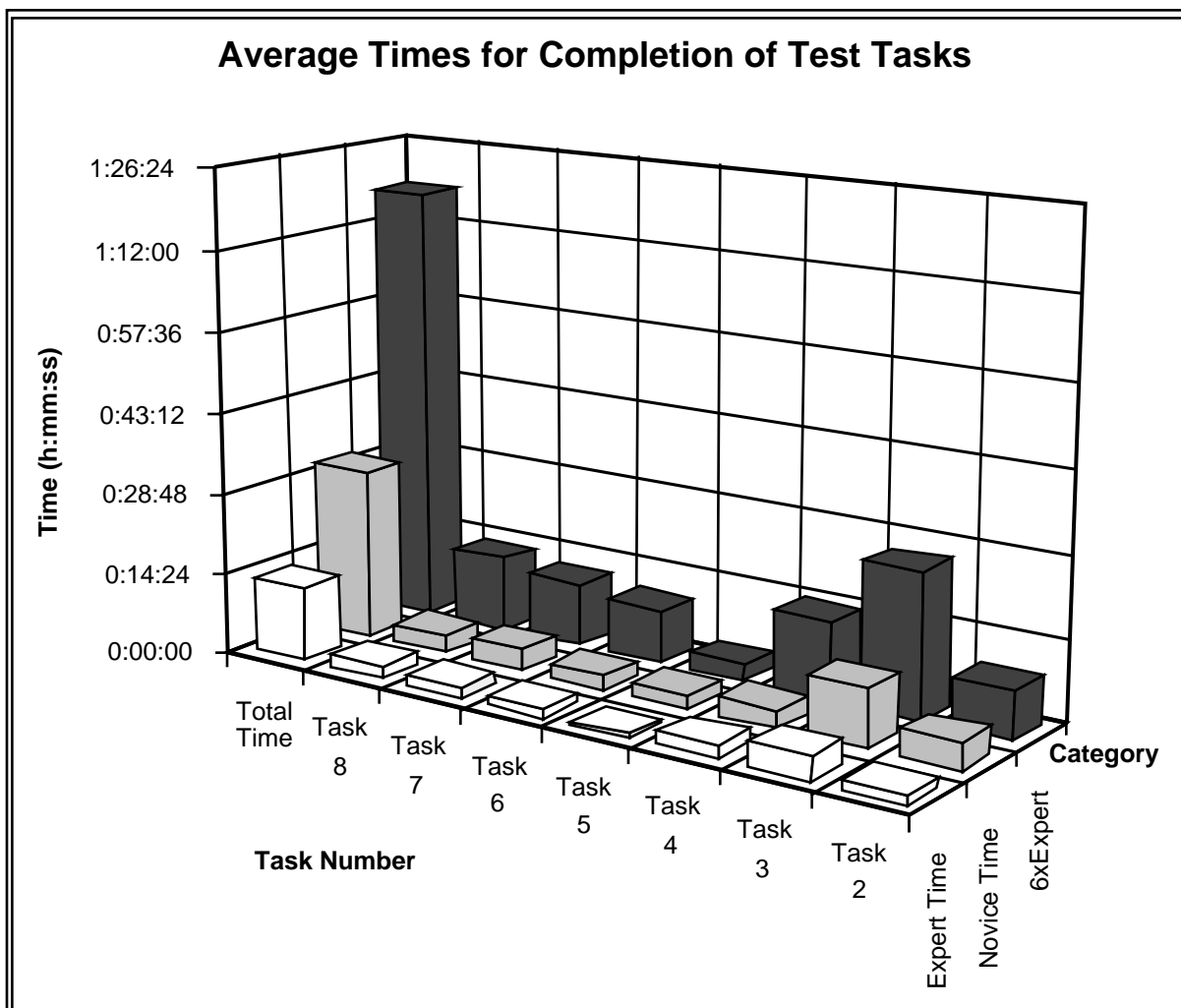


Figure 4-7. Average Times for Completion of Test Tasks by Participant Category

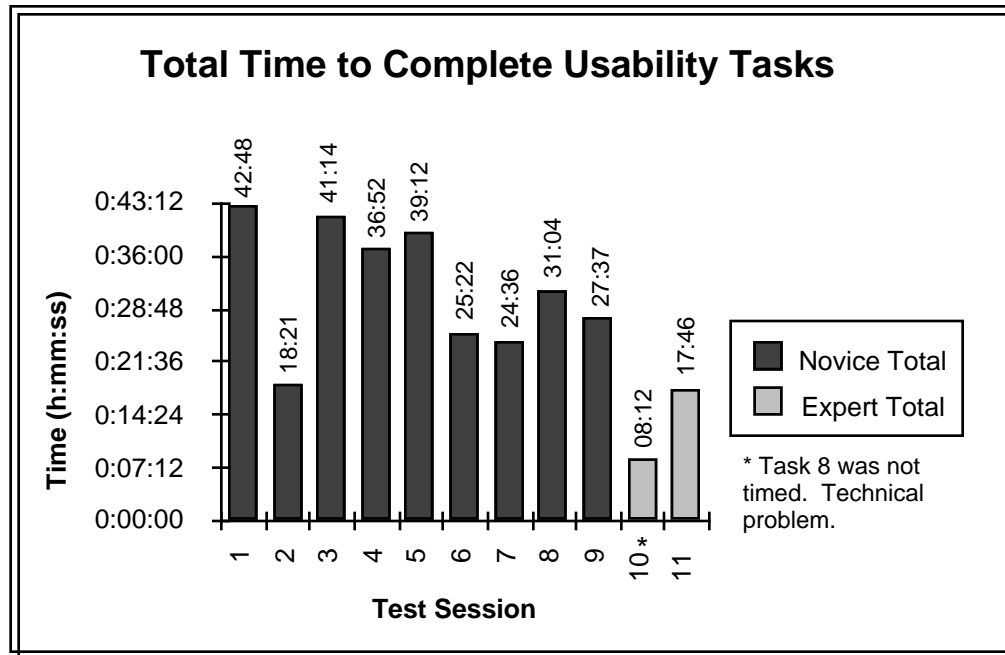


Figure 4-8. Time to Complete Usability Tasks by Test Session Number

4.4 Summary of Responses from the Exit Survey

4.4.1 Evaluators' Previous EP Experience

After the usability test was over, Participants were asked to fill out an "Exit Survey." The first section of the survey asked about the Evaluators' previous experience with the EPs and the EP4 brochure. Of the 15 EP4 Participants only 2 had used EP3; each of those experiences had been brief. As for their experience on EP4, two thirds of Participants said they had used EP4 for less than one hour, one third of the Participants had used EP4 for greater than one hour, but less than one day.

Participants were asked if they had read the EP4 Brochure, a 20 page informational packet that provided an EP4 system overview, instructions on how to log on, a demonstration tour, and information on future EPs and EP4 contact information (help desk, developers, etc.). Participants were asked if they had read the EP4 Brochure and found it useful. Of the seven users who had read or browsed the EP4 Brochure the five who rated its usefulness gave an average a rating of 4.4, or highly useful.

4.4.2 Evaluators' Previous Computer Experience

In order to gauge Participants' familiarity with the Workstation environment in which EP4 was built the second half of the survey queried Participants on their previous computer experience. One question asked Participants to check off from a list the different types of the software they

were familiar with. This list included text editors (vi, tex), word processing (Word, WordPerfect), file managers, spreadsheets (Excel), email, image processing software (Erdas, PCI, etc.), FTP, statistical packages (Splus), Mosaic/Netscape. All of the Participants had a working familiarity with 60-100% of the types of software listed. All but one of the Participants was familiar with WWW browsers such as Mosaic or Netscape and had used them for greater than one month.

Participants were asked to list the computers they used on a regular basis and which tasks or software types they performed. The majority of Participants leaned towards Macintosh users (10), whereas Personal Computer users numbered three. Seven Participants listed that they used multiple platforms (Macintosh/PC and Workstation). Only two Participants said they used Workstations exclusively, compared to five Participants who used Macintoshes exclusively, there was one Participant who used a PC exclusively. Of the Participants, none of the Macintosh users had a three-button mouse, however, each of the three PC users computers were equipped with the three-button mouse.

4.5 Lessons Learned from EP4 Usability Testing

A number of significant lessons were learned during the course of the EP4 usability testing. Most important of those was that usability concerns should be addressed at each stage of the design process, using paper prototypes if necessary. Many of the comments made by Participants focused on problems with design, text, and layout that could have been identified by application usability principles during design. Some of the Participants were drawn away from the more important task of evaluating the functionality of the prototype because they focused on missing words and phrases within the text and other inconsistencies.

The use of two Participants during a usability test session was a success. When two Participants work together to complete the usability tasks the session flows more smoothly. Teaming Participants up helps to lower the level of Participant anxiety, increase their confidence and improves interaction among the Facilitator and Participants. It is more difficult to schedule two Participants for usability test sessions but it is worthwhile.

Based on the information gathered in the Exit Survey ECS should conduct usability tests on both Workstations and Macintoshes/PCs; one third of the Participants used Macintoshes and PCs exclusively for their work. Tests could be conducted using applications such as Exodus on the Macintoshes or PCs. These multi-platform tests may more accurately reflect the working environment of ECS users.

Although the EP4 Evaluation Plan stated that a Demonstration Script created using a capture/playback tool would be used to demonstrate EP4 to the Participants it was not used. Due to technical problems it could not be used. Instead, the Facilitator gave an EP4 demonstration, following the Demonstration Script as closely as possible, to the Participants of each session. During the demonstration the Participants were able to ask questions, investigate other EP4 features not included in the demonstration (or the usability test), and in effect, tailor the demonstration to their own interests.

Test sessions were conducted in a room dedicated to the EP4 usability testing. Often the session Participants and Facilitator became quite loud, the ability to close the door and spare neighboring workers from distraction was appreciated. Use of a dedicated workstation to conduct test sessions was useful too, it made for control of the test environment much easier.

The usability tests would not have been worth conducting without the use of keen Observers to take notes at each session. Members of EP4 Development Team, EP4 Integration and Test and the ECS Quality Office were not only great Observers but often had insight into or answers about system design and installation when Participants asked questions.

4.6 Usability Test Results Summary

The nearly 1000 comments, observations, survey scores analysed and discussed above have been summarized into the top 10 results of EP4 Usability Testing:

- Consistency within EP4 is an issue - e.g., fonts, placement of buttons and double- vs. single-clicks for certain functions.
- Participants liked the use of Mosaic interfaces to present Help information and as the Advertising Service interface, however, more Mosaic capabilities should be provided (hot list, search “escape/abort” button, etc.)
- More thought should be given to the look and structure of information provided in the Advertising Service, what links are called, and where they are located.
- Window management is improved since EP3, but Participants found it difficult to navigate through different levels of the Workbench (e.g., the “Go Back” button).
- Scientists’ Workbench shows real potential, needs more work to make file management easier. Users want to move more than one file at a time and use of control keys.
- Indication of system activity must be improved (e.g., an indication that a command was accepted and being processed).
- EOSView file structure window needs to be made easier to use - highlight image files, rename/re-word cryptic text.
- Zooming and panning features in EOSView are liked but need some refinement, i.e., ensure panning window stays “in synch” with viewing window.
- Users want more control over EP/ECS environment, user preference file and capabilities should be prototyped.
- Interactive Evaluation Tool (IET) could be improved through the use of scrolling windows and a “data saved” indicator.

5. Interactive Evaluation Tool (IET) Survey

5.1 Survey Design

The Interactive Evaluation Tool (IET) is the on-line survey that both Independent Evaluators and Usability Test Participants were able to access during the course of their evaluation of EP4. This chapter will detail the results of the Independent Evaluators' input to the IET Survey. The survey was divided into four parts: Advertising Service, EOSView, the Workbench, as well as a section of more General questions on EP4. At the bottom of the survey screen an entry field was available for Evaluators to record their comments in a free-text format. In many cases Evaluators used this field to expand on their answers to the survey questions and comment on the features and capabilities of EP4.

The questions within the IET were developed by the Usability Test Facilitator, the EP4 Developers, and other ECS team members. Figure 5-1 is a diagram representing the IET survey development and implementation process. Re-use of questions used in the EP3 IET survey were given high priority so that benchmarks could be measured. To protect the integrity of the evaluation, some rules were established (Poston, 1994):

- Each registered evaluator was given a unique name and password. Comments and survey information were linked to the user who logged in.
- Non-registered evaluators were able to log-in using the “guest” account. Guest user comments were included in the data analysis but could not be attributed to a specific individual.
- To protect the integrity of the evaluation and the anonymity of evaluators, comments and survey results are reported without names.
- Upon request, a listing of comments made by an evaluator will be provided but only to that evaluator. The evaluator is free to publish his or her comments.
- During analysis of the survey data, groupings of comments or survey analysis were used to determine group unique tendencies in the data. The groups Expert vs. Novice EP4 users were used for analysis of usability test survey scores.

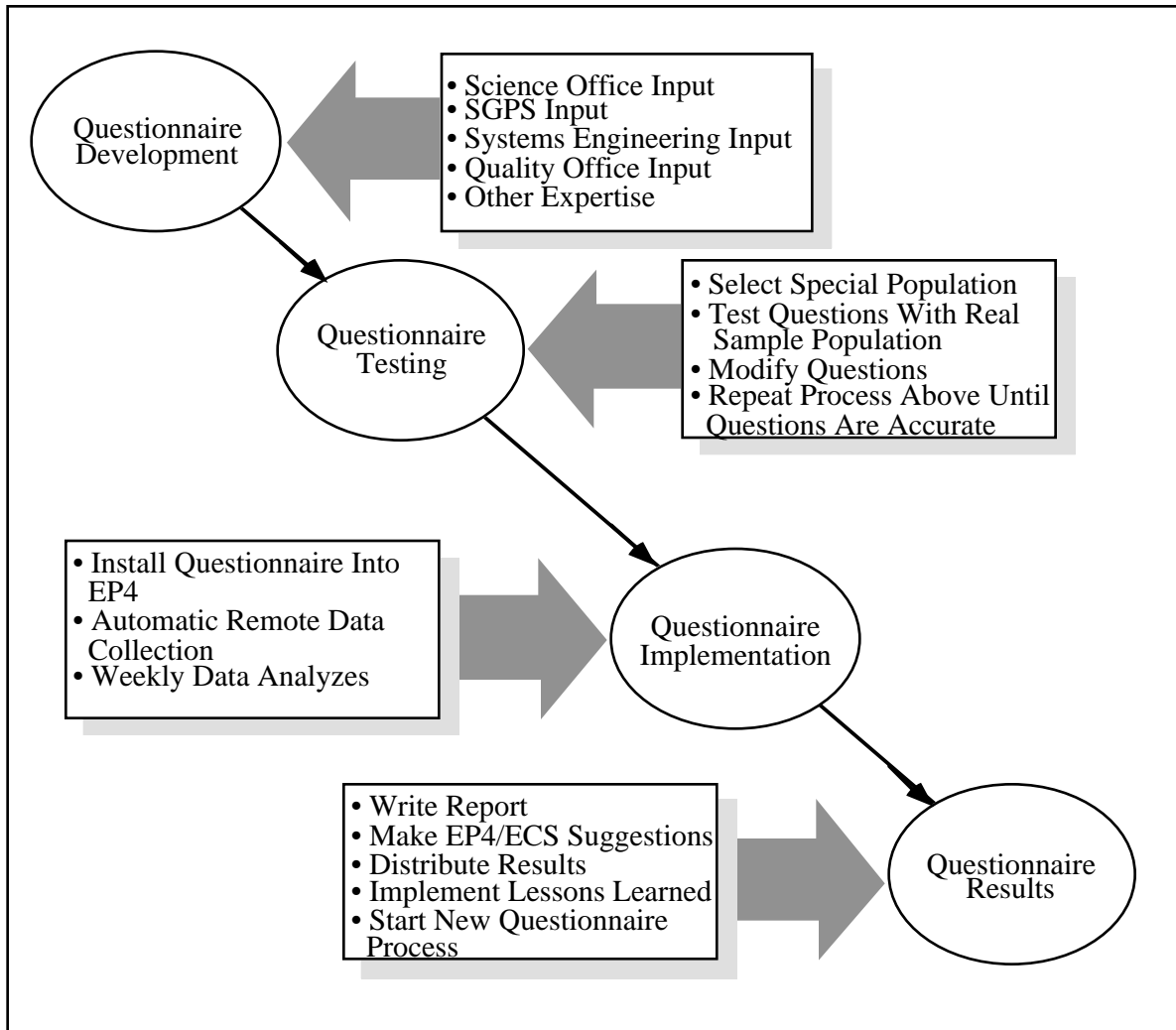


Figure 5-1. IET Survey Development and Implementation Process

5.2 Survey Results

Survey results have been divided into two groups Registered EP4 Evaluators and Guest logins. The division was made because it is not known who logged in to EP4 as a Guest. Registered EP4 Evaluators received notification that they were chosen to Independently Evaluate EP4. ECS established a user account and password for each Registered Evaluator, they were also given login instructions, and a brochure describing EP4. This brochure contained a short demonstration of EP4 and information on who to contact for Help, or more information on the EPs. Those logged in as Guests may have had access to this information, support from DAAC personnel or others familiar with EP4. For the most part the differences in survey scores given by the two groups are not significant, however the information was separated and provided for comparative purposes.

5.2.1 Advertising Service

Registered Evaluators' and Guest Logins' EP4 Scores from the IET

The Advertising Service section of the IET contained eight questions of which the highest score was given to the statement, "Navigation through various levels of the Advertising Service was easy" (Question 1). Both the Registered Evaluators and the Guest logins rated this statement highly giving it a 4.4 and a 4.0 (out of 5.0) respectively.

The Registered Evaluators and Guests gave similar scores to nearly all of the survey questions within the Advertising Service section of the IET. Survey respondents thought that the multiple methods of locating services and data are useful and it was easy to construct a query for advertised services (Questions 3 and 4). Contrary to those responses, Registered Evaluators and Guests were neutral on the issue of whether they liked the multiple methods provided for searching the database and if the ability to search for advertisements with Mosaic is an important part of the Advertising Service (Questions 2 and 5). These four questions may have been confusing to the Evaluators, this would help to explain the contradictory and neutral responses they received.

Guest Logins and the Registered Evaluators were not in agreement on the issue of whether it was easy to install new services from the Advertising Service to the Workbench (Question 7). Survey respondents divided themselves into two camps on this issue, those who thought it was very easy, and those who thought the opposite. Even though very few neutral scores were given, because of the nearly equal division of respondents, the scores averaged to a 3.1 out of a possible 5.0.

Perhaps most interesting is the difference in scores for the question, "The Advertising Service is easy to use" (Question 8). Registered Evaluators gave this question, on average, a score of 3.4, while the Guest logins gave a 2.6 out of 5.0. It is not easy to determine the reasons for the differences in the two scores. Lower scores may have been given by those who were not familiar with Mosaic or other WWW browsers. Higher scores may have been given by those who were assisted in their navigation of the Advertising Service. Because these evaluations were conducted in uncontrolled environments it is hoped that the differences will be clarified by the free-text comments entered by both Registered Evaluator and those logged in as Guest.

Table 5-1. Advertising Service: Statistical Data

Questions: Advertising Service Scale = 1 (strongly disagree) - 5 (strongly agree)	Evaluator Average Score	Evaluator Standard Deviation	Guest Average Score	Guest Standard Deviation	Number of Evaluator Responses	Number of Guest Responses
1. Navigation through various levels of the Advertising Service was easy	4.4	0.7	4.0	0.8	29	11
2. I like the multiple methods (hypertext, text search, and attribute search) provided for locating services and data in the Advertising Service.	3.3	0.9	3.1	1.4	30	11
3. Providing multiple methods of locating services and related data is useful.	3.8	1.1	3.6	1.3	29	10
4. It was easy to construct a query for advertised services	3.5	0.9	3.5	1.1	29	11
5. The ability to search for advertisements with Mosaic, is an important aspect of the Advertising Service.	3.0	1.0	3.0	1.1	35	17
6. The Advertising Service provided enough information for me to determine which services I should install on my Workbench.	3.4	1.0	3.4	1.0	35	18
7. The method used to install new services from the Advertising Service to the Workbench is easy to use.	3.1	1.1	3.1	1.1	35	18
8. The Advertising Service is easy to use.	3.4	1.0	2.6	1.0	33	18

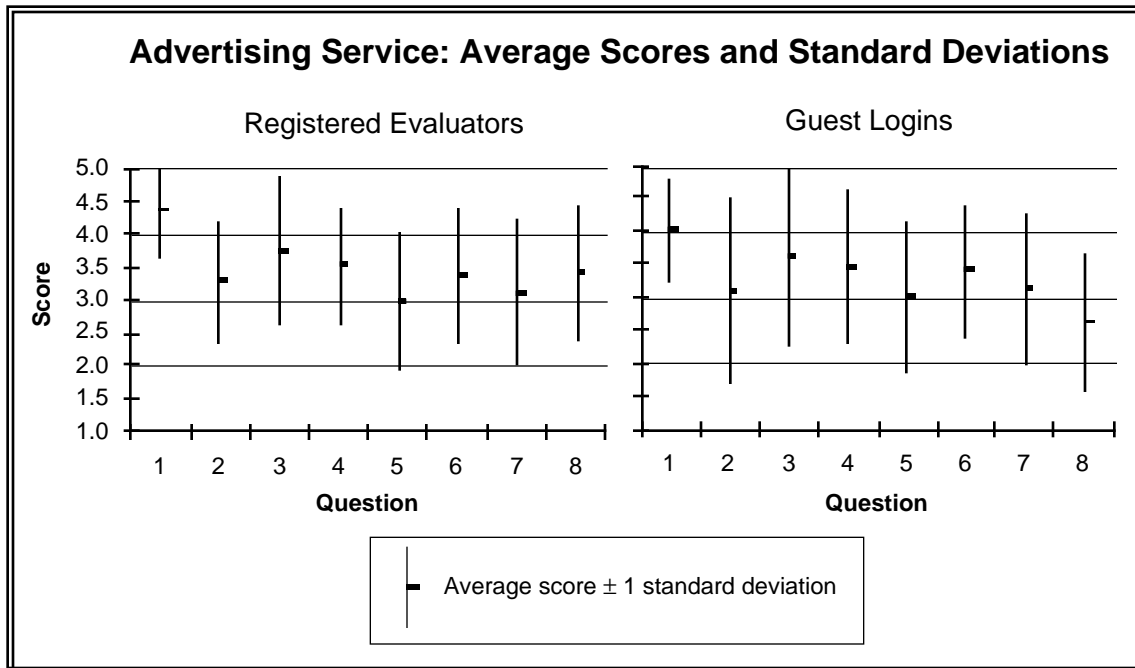


Figure 5-2. Advertising Service: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response

Registered Evaluators' and Guest Logins' Free-Text Comments Analysis

There were three main areas within the Advertising Service that Evaluators commented on: navigation through the Advertising Service, Multiple methods of searching, and the Search Services forms. Those evaluating EP4 from remote locations commented on aspects of using the Advertising Service related to internet linkages and remote access issues.

Many Evaluators found **navigation through the Advertising Service** to be a bit difficult in places. The majority of comments mentioned it was difficult to know how to search for data because of the confusing and at times cryptic link names. Another group of comments focused on the link hierarchy within the Advertising Service where services and data were organized by ECS, EOSDIS, General, etc. levels of service. Many stated that this information is just “noise” to the users, no one really cares what level of service the data and servers are located, they just want access to them. Services should be organized by service type: browse, subset, transform, etc.

An **Advertising Service “Road map”** was requested by a number of Evaluators. A “Road map” would provide users an overall picture of the Advertising Service. Expert users could refer to it and learn how to link straight to the services or data they are interested in. This would minimize the level of annoyance for those did not like navigating through the system one level at a time. Novice users could use the “Road map” as a guide to exploring the system. It would also help to reduce confusion if the users became “lost” within the Advertising Service.

Some Evaluators requested that the **wording in the Advertising Service** be made more user friendly and jargon-free. An example of a more user-friendly feature would be the inclusion of a “search” button prominently displayed on the first screen. This would lead users straight into the search function of the Advertising Service, rather than the current design which forces them to go through a couple of layers to find it. Provision of a “When in doubt choose me.” button next to the main “search” button would give new users a chance to be introduced to the Advertising Service, related features, the “road map,” etc.

Related to the previous issue, Evaluators commented that the **“text to link ratio” is too high**. A lot of information both technical and historical was provided for each link, this made for tedious reading, and in many cases, led the user to expect services and links that are not currently available within the Advertising Service. A number of Evaluators commented that they couldn't find the link to **GLIS** or to **Version 0**. Other comments said that there was too much “text recycling” for some links. One person commented that the text makes the Advertising Service sound more like a data history application, rather than for data searching and ordering.

Although some users liked the use of the **multiple methods** provided for searching the Advertising Service for services and data some commented that they didn't seem to bring back the same sorts of results. Users were not sure of which search method to use to find data and of the differences between the each search method. The Free-text hyperlinked search capability was very different from the other methods of searching the Advertising Service and a number of Evaluators did not quite know what to make of their free-text search results. It is clear from the comments that many Evaluators understood the multiple method search paradigm, however, a significant number of EP4 Evaluators were very frustrated and confused by this Advertising Service paradigm. One suggestion given was that a more guided approach be available for users so that this confusion is minimized.

Of all the Advertising Service IET Free-text comments those on the **Search forms** generated the greatest number of comments. Evaluators gave a number of **suggestions to improve the layout** of the forms themselves.

- Make the entire form fit on one page
- Make the “Submit” button more obvious
- Organize the parameter fields so that they are aligned with one another to make reading easier.
- Allow users to select the “Back” button and this would return the user to the place on the previous page, not to the top of the page so that they are forced to scroll down the page each time.

Evaluators **requested features** standard in Mosaic and Netscape:

- A feature that allows the previously entered search criteria information to be “remembered” by the Advertising Service. This would allow the user to change search criteria one at a time and perform multiple searches and the user wouldn’t have to re-enter ALL of the data.
- A system feedback indicator, such as a spinning globe (Mosaic) or “throbbing N” (Netscape) to inform the user that the Advertising Service is “still working...”
- Buttons to allow the user to “Cancel” or “Abort Search/Image Loading” are necessary, to allow time and resource-intensive searches or image loading to be canceled.
- Users would like the ability to set preferences in the Advertising Service so that large icons or images files would not be loaded without action by the user.

There were a significant number of **comments on the search parameters** in the Advertising Service search forms:

- No information was provided to the user regarding the number of search criteria a user must enter before submitting a search.
- Evaluators requested that glossary information on the search criteria be provided; it would be especially helpful to have it as a hyperlink (see URDB General Search Interface for example).
- Help should provide information on datasets, search parameters, acronyms, etc.
- Not clear to Evaluators if more than one sensor, platform, or discipline can be selected.
- Some Evaluators wanted to be able to enter their own user-specified search criteria.
- No indication of proper format to enter date and time for a search.
- It was not possible for users to enter in the desired latitude and longitude for a search. Others requested that users be able to select geographic coordinates by drawing a polygon on a map within the Advertising Service.

- Users did not like the use of “Protocol” as a search parameter. This type of database information should be transparent to the user, this type of parameter confuses more users than those who would understand what it means.

Some of the Evaluators were **confused by the text descriptions of the services** that were available through the Advertising Service. From the descriptions it appeared that subset services allowed geographical or temporal subsetting, but not both. One Evaluator was concerned that there would be a set of unique services for each dataset and that multiple services would be needed just to access data, the end result of this might be a very large number of services. How would users react to that? Could generic or more flexible services be developed?

The issue of “**dependent valids**” was raised by a number of Evaluators. An Evaluator commented, “The valids are not dependent, leading to high probability of no-hit searches. This is a well-known problem with WWW searching, and suggests the need for re-thinking the whole search paradigm.” The majority of Evaluators did not comment on the issue of dependent valids, however, many did complain that the searches they submitted did not return any “hits.” This may become a problem as users construct increasingly complex searches.

Those Evaluators who accessed EP4 from remote terminals commented on the necessity of having a “Cancel” icon. For applications “going out” over the Internet these “Cancel” buttons can help users who do not want to, or can not wait for a search to be completed, or for imagery to finish loading on their Advertising Service client. Comments by Evaluators on the EP4 system performance were mixed.

5.2.2 EOSView

Registered Evaluators’ and Guest Logins’ EP4 Scores from the IET

The IET Survey contained ten questions relevant to the EOSView visualization tool. In some cases the EP4 Registered Evaluators and those logged on as Guests responded to these questions in significantly different ways. The most significant divergence in scores was on whether panning and zooming of images in EOSView was easy (Question 3). Many Registered Evaluators gave this a neutral score of 3, while the majority of those logged in to EP4 as Guests gave very negative scores of 1 and 2 out of 5 to this question. The low scores may have been given by those who did not have access to DAAC support, had not read the EP4 brochure, or seen a demonstration of EOSView. One reason why scores given by Registered Evaluators were not higher is evident in the free-text comments, these will be discussed in a later part of this paper.

While the Registered Evaluators were neutral on whether they thought the ability to select different color palettes for image display was useful (Question 4), and on the usefulness of the EOSView animation capability (Question 5). The Guests provided similar, but significantly lower scores on both these questions. Registered Evaluators gave on average a score of 3.4, indicating weak agreement to the question of whether they thought EOSView animation speed was adequate (Question 6), the Guests were not so favorable, they gave an average score of 2.8 out of 5.0.

Both Registered Evaluators and the Guests gave, on average, weak agreement to the statements that it EOSView HDF window displays a file's structure clearly (Question 1) and it is easy to select a component of the file and view it as an image (Question 2). But both groups gave solid positive scores when asked if the EOSView window layouts were easy to understand (Question 8).

EOSView Help garnered on average strong positive responses from those logged on as Guests (Question 7). These users may have referred more often to the Help compared to the Registered Evaluators who gave a slightly lower, yet positive score to the Help function. Both groups also agreed that the functionality provided by EOSView is adequate for their needs and uses (Question 9). Finally, Registered Evaluators and Guests on average, agreed that they found EOSView easy to use (Question 10).

Table 5-2. EOSView: Statistical Data

Questions: EOSView Scale = 1 (strongly disagree) - 5 (strongly agree)	Evaluator Average Score	Evaluator Standard Deviation	Guest Average Score	Guest Standard Deviation	Number of Evaluator Responses	Number of Guest Responses
1. The EOSView HDF file window displays the file's structure clearly.	3.4	1.1	3.3	1.3	26	9
2. It is easy to select individual components (raster images and scientific data groups) of HDF files and view them as pseudo color images in EOSView.	3.3	1.3	3.1	1.7	27	9
3. Panning and Zooming of pseudo color images in EOSView is easy.	3.1	0.9	2.4	1.1	25	8
4. The ability to select different color palettes for the pseudo color image display was useful.	3.3	0.9	2.8	1.3	28	9
5. The EOSView animation capability is useful.	3.0	0.8	2.6	1.1	26	8
6. The speed of EOSView animation was adequate.	3.4	0.9	2.8	1.4	26	8
7. Help information/instructions provided for EOSView are understandable.	3.8	0.9	4.1	0.6	37	17
8. The EOSView window layouts are easy to understand.	3.6	1.2	3.9	1.0	36	16
9. The functionality (animation, panning, zooming, etc.) provided in EOSView is adequate for my needs/uses.	3.7	0.9	3.8	1.0	33	15
10. Overall, I found EOSView easy to use.	3.6	0.9	3.6	1.0	37	16

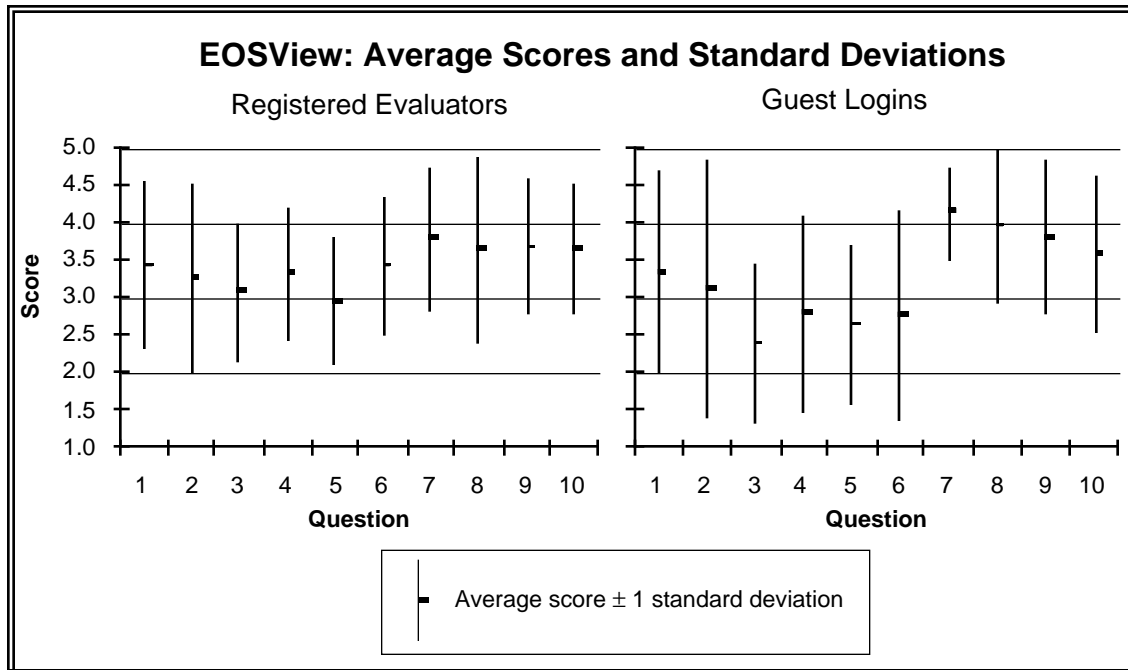


Figure 5-3. EOSView: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response

Registered Evaluators' and Guest Logins' Free-Text Comments Analysis

EOSView, the ECS visualization tool received a significant number of comments from Evaluators. These comments were divided into five groups: the HDF file structure window, pan and zoom capabilities, animation capabilities, EOSView Help, and overall comments on EOSView.

The comments of many Evaluators on the **HDF file structure window** can be summarized using the following quote from one Evaluator:

“[I am] not crazy about the idea of getting a listing of HDF file attributes that looks too much like the output from the “hdfed” utility (which I have always disliked because of its obscure references to tags numbers, etc.). Can’t this output be in simple English, rather than NCSA terminology? What ordinary user is going to know what SDS or vdata or RIS8 are?”

This Evaluator was referring to the **cryptic text** within the file structure window such as “+ Raster Image Group (nnn/nnn).” Even though instructions were available at the bottom of the window many users did not know what to do. If the text were highlighted to resemble a hyperlink or made to appear “click able” users would be able to view imagery. It would be made even easier for users if the text were written to convey the information that it is an image file.

Evaluators mentioned that they would like to be able to click on the ASCII data descriptions within the HDF file so that they could read about the contents of the file.

On a related topic, many Evaluators were disappointed they could not **view the text information** related to the images provided for EP4. At a minimum EOSView should be able to spawn an editor that will read these files. More important to EOSView users is the capability to view metadata, this is crucial and was strangely absent from EOSView.

EOSView **pan and zoom capabilities** received a variety of comments from Evaluators. Many users liked the capabilities provided in EOSView, however the means of activating them were not intuitive. A number of Evaluators commented on the use of the rather cryptic “Zoom +” and “Zoom -” to zoom in and out on imagery, they suggested the labels “Zoom In” and “Zoom Out” as alternatives. When Evaluators zoomed in on imagery they noted that the zoomed area was not centered on the cursor. This was even more noticeable and annoying to them when they panned around the image.

Evaluators thought that the small **panning window** was not very easy to use. It should be labeled “Pan Window” to indicate its function. When panning across an image Evaluators mentioned that it would be easier for them to see how the area of the zoomed image corresponded to the original image if a “zoomed area box” were provided in the “Panning Window.”

There were a number of comments on the **color palettes**, and the confusion many Evaluators had trying to use them. Comments indicate that the color bar should be labeled and have a scale. Evaluators did not think that the palettes provided were effective; some noted that the “Grey Scale” palette had colors in it. One Evaluator noted that none of the palettes appeared to improve the viewing situation, in most cases they made the images worse. Some suggested the color palettes should not be “changeable” when viewing a data product with its own color bar and scale; any other palette would be meaningless. However, users want to be able to manipulate the color palettes for contrast stretch and histogram equalization, they also want to create and import custom palettes. Perhaps of some concern to developers is the fact that Evaluators noticed that the palettes appear to be different on different computers.

A few Evaluators commented on the **Overlay option**. Many liked the way that it worked. One Evaluator suggested that it would be more effective if it had a “flicker” option so that users could toggle back and forth between images. Another suggested an Overlay “de-select” button.

For the most part Evaluators seemed pleased with the EOSView **animation capabilities**. The main comments discussed the lack of speed uniformity when viewing animations. This lack of uniformity makes for difficult viewing and may be especially hard on remote users. Users did like the warning provided by EOSView that the JPL images would take a long time to load and would take up a lot of memory. Because imagery can take a long load and animate Evaluators requested an “Abort” button.

EOSView Help received an interesting selection of comments. This may be taken as an indication that many of the Evaluators read the Help information because they couldn’t figure out how to use the application. A number of Evaluators noted that the Help implementation was different in look and feel from the Advertising Service or Workbench Help applications. They thought that the Help would benefit from a hypertext structure. Another user thought it would be

nice if a “search string” capability was provided in the Help. This would make it easier to find the specific thing the user was looking for.

Evaluators noticed some **inconsistencies** between the Help provided and the EOSView application. Many users were confused by the + Raster Image Group (nnn/nnn) text, yet the Help did not provide information on this or on Vgroups. One user noted that Help says that there is an option to ‘show frame number’ but there is no such option on the pull-down menu.

The Evaluators recorded a set of more **general comments on EOSView** perhaps most often mentioned was that the font used in EOSView was too small, it must use a larger font to make it easier to use. A large number of users had difficulty trying to find, open, and view HDF files. Many Evaluators complained that they were repeatedly bumped out of directories when trying to select files. Others received error messages that said, “File needs to be an HDF file.” when in fact the file they were trying to select was labeled “.hdf.” This is a serious problem that should be investigated.

5.2.3 Scientists’ Workbench

Registered Evaluators’ and Guest Logins’ EP4 Scores from the IET

The IET survey contained four questions on the Scientists’ Workbench. Registered Evaluators and Guests agreed that the “drag and drop” feature was easy to use (Question2). Similarly they thought it was easy to create new directories and move files around on the Workbench (Question 3). Invoking functions from the Workbench received a slightly positive score from both groups of Evaluators (Question 1). However, there were significant differences in the scores given by both groups to the statement, “the Workbench layout is easy to understand” (Question 4). Registered Evaluators were neutral on the subject, but those logged in as Guests were mildly negative. It is not clear why there was such a divergence between the two groups.

Table 5-3. Scientists’ Workbench: Statistical Data

Questions: Scientists’ Workbench Scale = 1 (strongly disagree) - 5 (strongly agree)	Evaluator Average Score	Evaluator Standard Deviation	Guest Average Score	Guest Standard Deviation	Number of Evaluator Responses	Number of Guest Responses
1. It is easy to invoke EP4 functions from the Workbench.	3.4	1.0	3.4	1.0	40	19
2. It is easy to start functions using the ‘drag and drop’ feature.	3.8	0.9	3.8	0.9	40	19
3. It is easy to create new directories and move files around to organize the Workbench to suit my needs.	4.0	0.9	3.9	1.0	39	18
4. The Workbench layout is easy to understand.	3.1	1.0	2.6	1.2	39	17

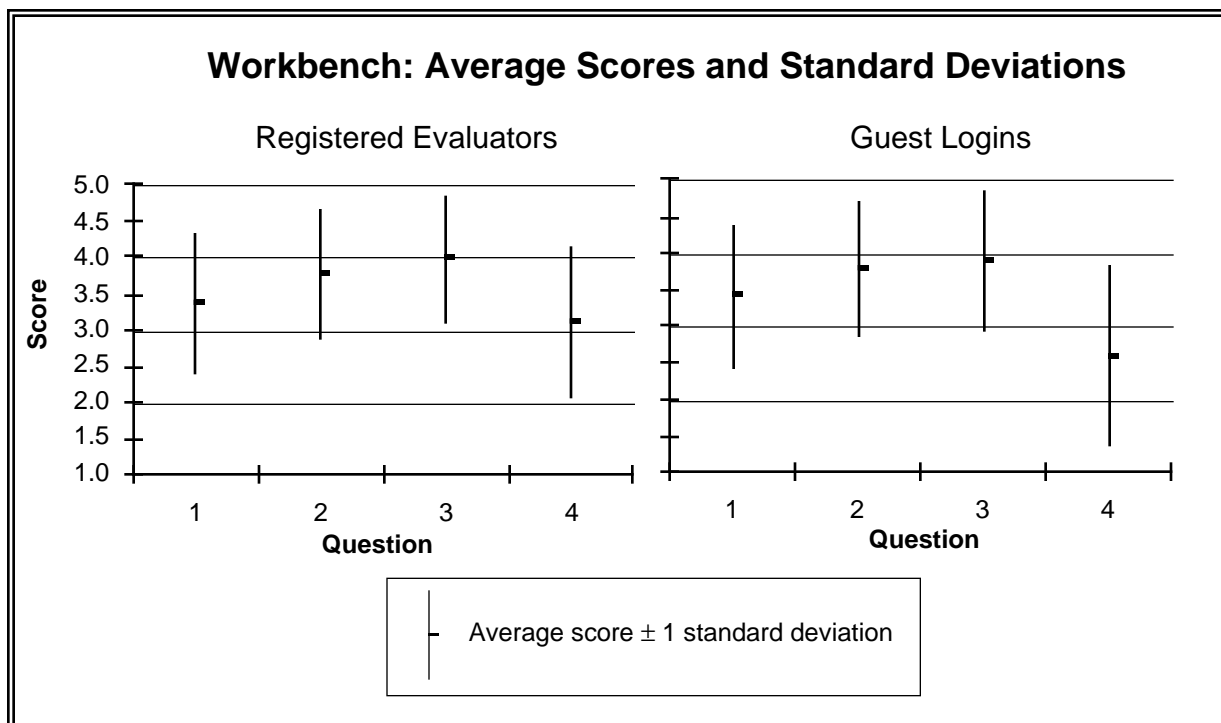


Figure 5-4. Workbench: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response

Registered Evaluators' and Guest Logins' Free-Text Comments Analysis

Comments on the EP4 Scientists' Workbench were grouped into 4 sections: pull-down windows, file management, and navigation through the Workbench.

Evaluators made a number of comments on the **Workbench pull-down menus**. Many people commented that they liked being able to access the ECS Data Handling Service (EDHS) and the Recommended Requirements Database (RRDB) through the Workbench. However, they did not like the use of these or any acronyms in the Workbench, this also includes the name Adv_Service for Advertising Service.

Some of the comments detailed the **placement of items within the pull-down menus**. A common suggestion was that all options should be seen at all times within the menu, for example in the "Action" pull-down menu. If the option is not appropriate it should be "greyed out." One comment suggested that the command "Execute," used to start or launch an application, should be placed under the "File" menu and re-named "Open." It would be more familiar to Macintosh users in this position, and could be used for both opening files and applications. Similarly, the option "Refresh," currently located under the "Tool" menu, should be moved to the "Action" menu, as "Refresh" is not a tool. The Help provided in the Workbench did not detail the pull-down menu options. This would be a good place to give detail about the EDHS and the URDB.

A significant number of users were surprised that they were not able to organize the **location of icons** on the Workbench. Many people commented that they like to place icons they access frequently or that are related to one another, in one area of a window. Others said that it would be useful if the Workbench allowed users to view their files by name, date, and size. A suggestion was made that the Workbench allow users to “rubber band select” icons by drawing a box around a set of icons and then selecting all of the icons within the box. Other capabilities requested were an “Undo” option for selection of icons, and the ability to copy icons.

Lessons learned moving files, service icons, and folders within the Workbench generated some suggestions from Evaluators. A **feedback indicator**, such as a change in cursor shape, or a highlighted icon or file, is needed to indicate that an action is taking place or that they system is aware of the request or action. Examples of these indicators include a clock face to indicate the system is copying a file, or a highlighted folder to indicate that it is the “target” location for storing an icon.

The **design and use of icons** in the Workbench received very few comments. One Evaluator wrote that he thought it was a good idea to restrict the number and type of icons used in the system. Perhaps, the comment made by another evaluator should be taken to heart, “...it is easy enough to tell what the folders are but the application icons were “lost” on me. Perhaps there should be an Icon Legend in the Help.”

As Evaluators navigated through the Workbench they commented that it was next to impossible to return back to a previous window or level in the Workbench. **The icon labeled “..”** was not recognized by most Evaluators as a means of getting back to the previous level. One Evaluator noticed the inconsistency that when this icon was highlighted there were no choices under the “Action” menu. A number of users commented that the Workbench windows should change as each new one is opened, for example, Workbench_1, Workbench_2, etc.

A related problem Evaluators encountered was that with **multiple Workbench windows** open it was difficult for users to recognize the difference between Close and Exit. Because of this, some expected the Close command to close the selected window of the Workbench. The Exit command should close that particular Workbench window and any windows related to that second Workbench. In EP4 the Close command acts as users expected it should; the Exit command will close and exit all Workbench windows for all Workbench sessions. This confusion may have caused a large number of what users described as crashes, which were in fact, the system operating just as it was programmed. Developers should examine what can be done to minimize confusion and meet user needs.

While many Evaluators liked the Workbench capability that allowed them to delete items from the Workbench it was noted that **not all Workbench items are equal**. It is possible to remove the Advertising Service icon without any additional warning. This is dangerous and a reminder (dialog box) should activate if a user highlights an application for deletion. When this dialog box opens up it should contain a warning and perhaps any consequences that might occur if the item were deleted; the Cancel button should be highlighted.

There some more general comments about the Scientists’ Workbench. Some Evaluators mentioned in inability for users to set their preferences within the Workbench. Many suggested that users be able to change the default setting of opening new Workbench windows in place, to

opening them as new windows. Others noted the inconsistency of having to use two different mouse buttons to install and store icons from the Advertising Service.

5.2.4 General

Registered Evaluators' and Guest Logins' EP4 Scores from the IET

Both the Registered Evaluators and those logged in as Guests mildly agreed with the statement, "Navigation through EP4 is easy" (Question 1). But the two groups diverged on the topic of whether or not the window layouts were easy to understand (Question 2). The Registered Evaluators, on average, agreed that they were easy to understand, while the Guests, on average, were neutral. While both groups liked the way the EP4 Help function was implemented (Question 3), they differed in their opinion of whether the information provided was instructive (Question 4). The fifth question received the fewest number of responses than any other General question, many of the Evaluators did not know that they had to link to the next page in the survey to see this question. However, of those who did respond, on average, they had a positive experience using the EP4.

Table 5-5. General: Statistical Data

Questions: General Scale = 1 (strongly disagree) - 5 (strongly agree)	Evaluator Average Score	Evaluator Standard Deviation	Guest Average Score	Guest Standard Deviation	Number of Evaluator Responses	Number of Guest Responses
1. Navigation through EP4 is easy.	3.5	0.9	3.4	1.0	38	26
2. The EP4 window layouts are easy to understand.	3.7	0.6	3.1	0.7	38	25
3. I like the way the EP4 Help function is implemented.	3.5	0.8	3.2	0.9	37	25
4. The help information provided for EP4 is instructive.	3.4	0.8	2.9	1.2	36	23
5. My experience using EP4 was positive.	3.7	0.7	3.3	1.0	29	14

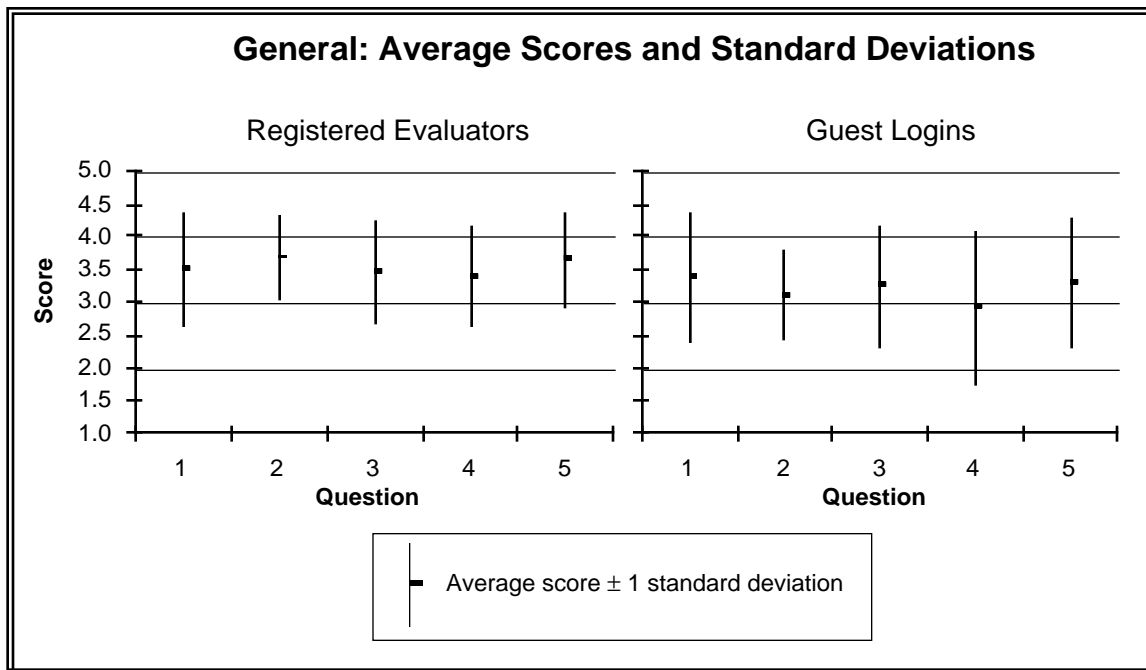


Figure 5-5. General: Average Scores and Standard Deviations by Registered Evaluator and Guest Login Survey Response

Registered Evaluators' and Guest Logins' Free-Text Comments Analysis

EP4 Evaluators entered a number of comments in the IET that were of a more general nature. Many of the comments offer suggestions that would benefit the entire EP rather than just an application or window design.

By far the most requested feature was the need for **feedback indicators** such as an hourglass, clock timer, "please wait..." to let the user know that the system is processing the user's action, command, or movement. Although feedback indicators were implemented in some areas of EP4 applications, where it was implemented it was inconsistent. It is obvious from the volume of comments, that more complete and consistent implementation of feedback indicators should be a developer priority.

Some Evaluators commented on the use of EP4 to store services and data in a **directory called .ecs** in the users' home directory. While the Evaluator liked this, they thought storing ECS information in a "dot file" in a users' home directory might not be the best place. The reason given was that some users have their accounts set up so they don't see these files. It might be a good idea to detail this information on this in the Help so that users are aware of it.

It was also suggested that a detailed **style guide for developers should be available**. This would help to ensure that applications and services advertised on ECS will have some basic uniformity and consistency.

Font size was commented on by a number of Evaluators, they all said it was too small for comfortable reading. Users would like the fonts used in ECS to be larger, or preferably, user-defined.

The **Interactive Evaluation Tool** was the subject of a number of comments. Many of them suggested the use of scroll bars rather than “next page” buttons for use in moving through each section of survey. While users liked the capability to re-size the IET window and objects within it, they didn’t like the fact that objects could be re-sized to the point that they disappeared altogether. Objects such as the “save” and “exit” buttons along the bottom of the IET window should have a maximum size, objects such as the free-text window should have a minimum size. At no point should the questions disappear completely.

The free-text comment field at the bottom of the IET window should be labeled as such. It is not clear how many Evaluators did not know they could enter comments in the field. Finally, there should be something that indicates to the user that their comments have been saved by the IET. An Evaluator wrote, “I’m saving all this, but there is no indication the save is working.” It was suggested that the “save” button be greyed out once the save is complete and that it not be activated until changes are made to the users’ comments or survey scores.

There were a number of comments on the subject of **EP4 Help**. A number of complements were received on the use of a Mosaic interface to provide Help information. One user wrote that it would be nice to be able to open a Mosaic Help window and leave it running. When the user accessed Help at another point in the system, or using a different application, the currently running Help window could be re-refreshed, rather than spawning a new one.

Mosaic, and **modified Mosaic interfaces** are used throughout the system for Help, the Advertising Service, the EDHS, and the URDB. Some users were confused by the different uses of Mosaic and the different options provided for each interface. It was suggested that “...they should be incorporated in such a way that the look and feel are consistent in a seamless way.” In the case of the Advertising Service the hyperlinks did not change color after they had been selected, users requested this be implemented.

Better hyperlink management was requested by Evaluators. In many cases they expected a link to provide more detailed information in the various Helps and in the Advertising Service they ran into some “dead ends.” Related to this, a number of Evaluators commented on the message “Sorry the link has moved to a new location” that they received when they tried to connect to the RRDB from the Workbench. This change was due to the fact that they RRDB had been renamed as the URDB, the related Home Page was located at a different link. These changes were made after the EP4 had been compiled, shipped, and installed at the various DAACs and universities. Unfortunately, it was not possible to fix the one line containing the link information in the EP4 code without extensive use of ECS resources.

From the comments recorded in the IET it appears that many Evaluators found it relatively easy to navigate through EP4. Many of them made reference to the EP4 Brochure and more detailed navigation instructions provided by ECS. In other instances, Evaluators were guided through the system by DAAC representatives. Many commented that, “I wish I could have been able to do actual browsing or searching and get some results. This would have made it easier to get an idea

of what the system will be like to run.” Most Evaluators would probably agree that the EP needs work but it is off to a strong start.

5.3 Lessons Learned from the IET Survey

A number of Evaluators and Usability Test Participants thought that the IET should have scroll bars rather than a “next page” button. A number of people missed the “next page” of the four survey sections. This is most clearly evident in the number of responses to General survey questions one through four, approximately half as many Evaluators answered question five because it was on a second page.

Evaluators liked that the IET window and the free-text comment field were re-sizable. But many thought that users shouldn’t be able to resize to the point that the questions disappear, or buttons become huge. There should be a minimum size for some each of the functions of the IET.

The IET questions should have been tested within the context of a complete usability test, this would have uncovered questions containing unclear wordings. Some of the survey questions may not have been as effectual as hoped, solely for the fact that users in real-world Evaluations were not able to understand them.

The IET must provide a “comments saved” notice, Evaluators commented that they were never sure if their comments and survey scores were saved. To be sure they were, Evaluators saved their comments often. Because of this, the database storing the comments and scores became quite large and the free-text comment data “messy.” Total time required to re-format the data took longer than anticipated.

5.4 IET Results Summary

The IET recorded over 1100 comments and survey scores. The details of these comments were analysed and discussed above. A “top 10” summary of these comments is listed below:

- ECS should provide a “Road map” of the Advertising Service so that users can see the overall structure of the Advertising Service; expert users could use this as a means of getting straight to the service or information they need.
- Link management and the quality of text and information provided in the Advertising Service must be improved.
- Improvements on the Advertising Service Search Forms in terms of content and design are provided, they should be incorporated into the next version.
- Removing technical HDF text from the EOSView file structure window would make the viewer easier to use, especially by those users who are unfamiliar with HDF.
- EOSView should include a means for users to view metadata, without this capability it will be very difficult for users to order data.
- Placement of items in the Scientists’ Workbench pull-down windows should be examined and improved. Some items are better placed in other menus. Do not use acronyms in menus.

- EP4 Help must contain better and more information on what EP4 services, applications, and objects are available, how they work, and why they should be used.
- Feedback indicators (hourglass, stopwatch, etc.) must be consistently implemented in ECS.
- A Style Guide should be available to developers to improve look and feel consistencies among ECS and Advertised services and applications.
- Users want more control over the ECS environment, for example through user preferences and file management options. But user limits should be enforced by ECS, for example, when re-sizing windows (maximum and minimum sizes) and warnings given before deletion of applications.

6. Summary of EP4 Evaluation

6.1 EP4 URDB Entries

EP4 Evaluators generated over 1300 comments, of which, the following 20 high level comments were entered into the User Recommendations Database (URDB). These entries were developed from the analysis of Evaluator comments stored in the IET and from comments and observations made during usability testing. Comments were entered into the URDB if they met one of a few criteria: 1) they were recognized as potential new ECS requirements, 2) they represented implementation details or design considerations that ECS developers should be made aware of, or 3) they were potential ECS policy decisions.

These recommendations were entered into the URDB as "Author: Unknown" and "Recorder: Janice Poston Day" unless otherwise noted. All of these entries were assigned the keyword "EP_4" in addition to any other appropriate keywords. To search for the EP4 related URDB entries it is recommended that the keyword "EP_4" be used as the search criteria.

Information on all URDB entries related to EP4 will be available in the URDB and on the URDB Home Page under the link "URDB entries under Design Consideration." To find out more about the URDB, how to log on to the URDB, the analysis process, and the URDB entries themselves please access the Home Page at <http://epserver.gsfc.nasa.gov/urdb/urdb.html>

EP4 URDB entries:

ID: 755

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: Printing hard copy of search order form

RECOMMENDATION DETAILS: Users should be able to print any windows so that, if a search or order is placed, the user has a permanent hard-copy? This will help confirm whether or not the request was filled completely properly.

ID: 743

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: "Abort" or "Escape" button is needed to cancel actions in EP

RECOMMENDATION DETAILS: During the evaluation of EP4 users noted that system response time can vary greatly due to a variety of reasons including system load, size of data being loaded, scale of search, etc. It is recommended that an "Abort" or "Escape" button be included to cancel searches or data image loading that is taking an inordinate amount of time. This feature should be included in EOSView, the ECS visualization package and the Advertising Service. It was noted by many EP4 Evaluators that Mosaic currently offers such a capability.

ID: 744

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: EOSView panning cursor should show image values

RECOMMENDATION DETAILS: During the evaluation of EP4 one user noted that EOSView would be more useful if the pixel x,y coordinates, digital number values, and geographic latitude and longitude were displayed as the cursor moved across the image.

ID: 747

ORIGINATOR: DAUCSAVAGE, JOHN C RECORDER: DAY, JANICE M

SUMMARY: EOSView Overlay Feature

RECOMMENDATION DETAILS: Overlay has meaning if you have a flicker option so that you can bounce between images to see changes or differences between the two.

ID: 748

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: EOSView: EOSView Panning Feature

RECOMMENDATION DETAILS: It would be helpful if the outline (a box) of the zoomed area appeared in the postage sized panning window. This box would correspond to the zoom factor and the area visible in the larger viewing window. It would allow user to maintain their orientation within the large image while zoomed. Labeling the window "Panning Window" would also help users figure out what the postage stamp window was for.

ID: 749

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: EOSView: Animation Feature

RECOMMENDATION DETAILS: Creating a movie loop in EOSView using scripts sounds time-consuming. It'd be nice to be able to animate all images (frames) by placing all of the images into a directory. Then the directory could be highlighted and the files within looped together into an animation.

ID: 750

ORIGINATOR: UNKNOWN, UNKNOWN

RECORDER: DAY, JANICE M

SUMMARY: ECS Visualization

RECOMMENDATION DETAILS: ECS should implement something like "Browse-a-rama," the helper in Mosaic that views HDF files. It gives a nice postage stamp, with a phrase "this image has dimensions x by y and contains the following descriptions info <insert annotations from file>" Its a nice overview before subjecting users to words like "number type, numeric data group, machine type" and other HDF guts that many folks don't want to know about.

ID: 751

ORIGINATOR: DAUCSAVAGE, JOHN C

RECORDER: DAY, JANICE M

SUMMARY: Importing Data to EPs

RECOMMENDATION DETAILS: Hope to be able to import user-generated GIF HDF files into the next EP version.

ID: 757

ORIGINATOR: UNKNOWN, UNKNOWN

RECORDER: DAY, JANICE M

SUMMARY: EOSView should allow users to view metadata

RECOMMENDATION DETAILS: I think EOSView should contain the ability to view metadata associated with the granule being viewed.

ID: 745

ORIGINATOR: UNKNOWN, UNKNOWN

RECORDER: DAY, JANICE M

SUMMARY: Mosaic interface for the Scientists' Workbench should be provided

RECOMMENDATION DETAILS: Some EP4 interfaces were prototyped using a Mosaic interface: the Advertising Service and the Help. In addition, EP4 accesses, the URDB, and EDHS also used Mosaic interfaces. WWW Browsers such as Mosaic are powerful tools that are user friendly and easy to program and offer a variety of capabilities. ECS should consider making the Scientists' Workbench available using a Mosaic interface.

ID: 746

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: Users should be able to set User Preferences

RECOMMENDATION DETAILS: A significant number of EP4 Evaluators commented that they would like to be able to customize their Workbench and default settings. ECS should prototype user preferences in the next EP.

ID: 753

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: Workbench: Pull-down menu

RECOMMENDATION DETAILS: If the options can change in the pull-down menu, the ones that cannot be chosen from should be dimmed or something. In any case, ALL the options from a menu should be visible at all times, even if certain options cannot be picked at the time.

ID: 754

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: Scientists' Workbench: File Management Improvements

RECOMMENDATION DETAILS: The EP4 Scientists' Workbench could be improved by including a few capabilities to make file management easier for the user. Users would like to be able to select more than one file at a time using a "rubber band select." This type of select involves drawing a box around a set of icons and selecting all icons within this box. Some EP4 Evaluators requested that files in the Workbench be viewable by date, size, and icon.

ID: 758

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: Workbench: New capability

RECOMMENDATION DETAILS: The user should be able to organize the location of the icons on the Workbench (like one can do with Macintoshes). For instance, one could put a row of similar objects along the bottom of a window.

ID: 759

ORIGINATOR: UNKNOWN, UNKNOWN RECORDER: DAY, JANICE M

SUMMARY: Workbench: Deleting Applications without warning

RECOMMENDATION DETAILS: It is possible to delete the Advertising Service from EP4 without any additional warnings. I tried this to see what would happen because I know of some people who might do this by accident. I was hoping to see an extra warning message about the consequences of doing this or a reminder of why this was important NOT to delete. I would suggest an extra dialog box with a message stating that it was recommended to not delete this and the Cancel button be highlighted.

ID: 760

ORIGINATOR: PACKMAN, DANIEL RECORDER: DAY, JANICE M

SUMMARY: EP4 GUI needs more than mouse input

RECOMMENDATION DETAILS: A GUI is nice but without a programmatic and command line interface, it is inadequate and incomplete. If you know what you want to do, you don't want to fool around with a mouse.

This recommendation is related to the different level of interfaces ECS should provide. The user would be able to choose which interface they wanted to use: 1. Novice GUI, 2. Intermediate GUI, 3. Expert GUI, 4. Command line interface, 5. Programmatic interface (API)

ID: 761

ORIGINATOR: CRAIG, CHERYL RECORDER: DAY, JANICE M

SUMMARY: ECS should allow the ability to re-size windows in EPs

RECOMMENDATION DETAILS: The ability to have all windows resize down to smaller screen sizes (especially the login window and the Search the Advertisements, Earth Science Data and Related Services - the Platform subwindow was always off the edge). Is this a bug and therefore not appearing as a new feature?

ID: 762

ORIGINATOR: CRAIG, CHERYL RECORDER: DAY, JANICE M

SUMMARY: Workbench: Icon should highlight when selected

RECOMMENDATION DETAILS: Once a user double-clicks on an icon it should change in some way (highlight, color change, etc.) so that remote users can see that things are happening (I watched someone else have this same problem). This would give users some feedback that the system has accepted their command and is processing it.

ID: 752

ORIGINATOR: DUERR, RUTH

RECORDER: DAY, JANICE M

SUMMARY: ECS Style Guide must be distributed

RECOMMENDATION DETAILS: Given that each data center within and outside ECS is likely to create its own tools, etc. a developers' style guide that is very detailed (i.e., all applications will have the following menu bar structure, file at the right with the following options, etc.) is needed. ECS should make such a style guide widely available so that all EOSDIS developers use the standard. In the sense that Apple originally created standards for how its applications should be developed, and widely distributed them.

ID: 756

ORIGINATOR: UNKNOWN, UNKNOWN

RECORDER: DAY, JANICE M

SUMMARY: "Application Working..." icon needed

RECOMMENDATION DETAILS: Put up a clock cursor to show me the application is doing something. See Mosaic for an example (the spinning earth). The applications need this feature because of they go out on the net to get information and this takes time.

6.2 Recommendations to Developers

Evaluation of EP4 revealed a number inconsistencies and trouble spots for users. Usability tests or Human Factors reviews conducted at each stage of the design phase using paper prototypes would probably have caught the majority of the inconsistencies and areas where users became confused. Paper prototyping saves time and energy and increases development efficiency and the overall quality of the product, they also help to reinforce the importance of adhering to standards. Future users can be brought into the review process to tire kick ideas and paper prototypes.

All tolled, Evaluators spent hundreds of hours exploring the EP4 and commenting on their experiences either in the IET or during Usability Testing. ECS received over 1300 comments from these Evaluators on EP4. Of these comments, 19 were entered as formal recommendations into the User Recommendations Database (URDB). It is important to the Evaluators and to the success of the ECS development process that each of these entries is responded to promptly and thoroughly by the developers responsible for the next user interface prototype, EP6.

Sections 4.6 and 5.4 of this paper contain summaries of the comments received through Usability Test sessions and the Interactive Evaluation Tool. These represent the top 20 recommendations for improving the EP from the Evaluators to the Developers. Developers should examine these recommendations and investigate ways of incorporating these recommendations into the next version of the ECS interface. Evaluators will be looking carefully at the next EP to see if their recommendations have been implemented, if they have not, the Evaluators will be looking for explanatory responses from the Developers.

Many of the Evaluators' comments focused on their desire to have more control over the EP interface. Comments ranged from the desire to change font size, to control over location of icons on the Workbench, to the ability to change system defaults (OpenNewWindow vs. OpenInPlace commands). Allowing the user greater control over their personal system preferences has not been prototyped and should be examined for inclusion in the EP6.

6.3 Answers to Frequently Asked Questions by EP4 Evaluators

A number of questions from Evaluators were input to the IET. This section attempts to answer those questions:

- Why couldn't users directly connect to the URDB from the Workbench pull-down menu?

After the EP4 was compiled, tested by ECS Integration and Test, then shipped and installed to the remote sites, the RRDB completed a name change. This change to URDB entailed a revision of the home page location, however, the EP4 link pointed to the old RRDB home page. An error message with the new link was inserted in the location of the old RRDB home page so that EP4 users would be able to connect to the new URDB. It would have been too expensive to change the line of code affected, recompile the EP4 code, ship and install it on all of the remote sites.

- The Advertising Service mentioned links to Version 0 and GLIS but we couldn't find them, where were they?

There were no links from the Advertising Service to operational services outside of ECS. Because EP4 was a prototype it would not have been appropriate to allow users to connect to operational systems and services outside of ECS.

- So many of the ECS Advertised services were not functional, why?

The Advertising Service was a prototype, not only for users to evaluate in terms of look and feel, but in terms of content as well. Many of the services that were available as icons and advertised in the Advertising Service were used as examples of what a user might find available once the Advertising Service was populated with services offered by data providers. It was not the intention of EP4 to provide and support functioning services.

- The search services form didn't look the same in the EP4 Advertising Service as it did in the EP4 Brochure, why?

The EP4 Brochure was used as promotional material and as a very general walk-through on paper of the capabilities of EP4. One of the constraints to producing the brochure was the size of the Brochure itself. It would have been too expensive to duplicate each screen in the demonstration at full size within the Brochure. Some of the screen area that was not pertinent to the walk-through demonstration was edited out of the screen grabs used in the Brochure.

- The Zoom buttons in EOSView look like "OOM+" and "OOM-" on my screen.

This was commented on by a number of Evaluators. This was not a typographic error, they were in fact labeled “ZOOM+” and “ZOOM-.” Unfortunately this error could not be duplicated at the Landover Development Facility. This has been passed on to the developers of EOSView for investigation.

- In the EOSView file structure window there were lines of text that read, “+ Raster Image Group (306/201), what do these numbers mean?

These numbers represent HDF “tag” and “ref” numbers. The “tag” is a special number for different objects such as raster images, numeric data groups, palettes, etc. The “ref” is a reference number of the object and may or may not be sequential. The creator of the file has complete control over these numbers. These numbers are for user reference only and would only make sense to a user with in-depth knowledge of HDF, or to the person who created the file. These numbers will probably not be in future releases.

7. Bibliography

- Dopplick, T. and G. Percivall, "Next Generation EOSDIS - The Evaluation Packages," The Earth Observer, Vol. 6(6), 1994.
- HAIS, (1995), Next Generation EOSDIS The Evaluation Packages: ECS Evaluation Package 4, Brochure.
- Hoffman, (1994), EP3 Evaluation Report, Technical Paper, 194-TP-441-001.
- Nielsen, Jakob (1994), Usability Engineering, User Interface Strategies '94, University of Maryland at College Park.
- Percivall, G. (1994), Multi-track Development for the ECS Project, FB9404V2.
- Poston, (1994), EP4 Evaluation Plan, Technical Paper, 222-TP-002-001.
- Szczur, Martha (1993), Usability Testing - On a Budget: a usability test case study, NASA/GSFC.

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Appendix A. Usability Test Tasks and Observations

The following are the comments made by Usability Test Participants and the observations made by the Test Observers. The comments are listed by task number and begin with the comments and observations made during the EP4 Demonstration.

Comments made by Usability Participants during the EP4 Demonstration:

- Should be able to enlarge the fonts on the welcome screen. Hard to read.
- What does EDHS and RRDB stand for? Is that explained somewhere?
- What is the advantage of putting something in the advertising service.
- Adv. Service icons should be reflective to the service they're providing.
- Some discussion on differences between search/data sets. What's the difference? How do I use each one?
- Icon should be used more creatively than they are now.
- Hyper link doesn't show where you came from.
- When you go back you lose where you were.
- EOSView color bar should be able to be enlarged to see it, overlay it on the image for comparison, needs more flexibility.
- Enlarging window should enlarge the window as well.
- Can I put in my own color scale?
- When you change color palette the actual image colors don't change.
- Scientists don't just look at data. They have their own viewing tools they use. What's the difference between EOSView and browsers provided by the data set providers?
- Do you have any links to V0?
- How are comments incorporated back into the program?
- What are the plans for EOSView? More than a viewer? Less than an image processing tool?
- We need to put HRD into EP's to show what ECS is going to do. Tabular data to allow users to request what they want to get a hold of.
- Next EP needs larger range of potential products.
- What did I do last time? I can't recreate or see what I've already done.
- Make fonts variable in size (user adjusted)
- Icon should relate to the application/data (was reference to the "South Asia" icon).
- Seems there is an initial confusion about how the menu structured search/browse.
- Use the icon more creatively. Like colorcode it for cost, volume, etc...
- Able to keep the history of where you've come from (like Mosaic abilities).

- easily forgot what I did to get here.
- much of the “things” is related to what Mosaic has as features.
- One suggested that we can expand on what Mosaic has, but that is not limited to what the problem is at present.
- Not quite sure what he said about the color bar on one of the EOSView images (he wants a more flexible color bar - moveable, expandible, wants to be able to read values off the bar).
- Comment on the shift from EP3 to EP4 and changes are so different how do they comment on the new thing such. Worried about the shift changes from EP3 to EP4 to EP5. EOSView as an image processing product.
- They thought that EOSView is sort of half job. If the view only shows the image but does not do more than the applications scientists currently use then what is the point of EOSView?
- How much functionality do you want to have? is the question. If it has more functionality then it is more like an image processing software, who is in charge to decide the “cut off point” for development?
- Suggestion to make EOSView more than a viewer, but less than a full image processing package.
- Would like to see a bigger range of data (high resolution, tabular data, etc) in the EP.
- Would like to have a “history of what I did” file available from the EP.
- EOSView - did the image window show X,Y cursor coordinates? - No.
- Are the dimensions of the window shown or not (ex: image is x pixels by y pixels in size)? - No.
- Is there one selection per attribute?
- Who decides what disciplines are applicable?
- Assignment of disciplines is very difficult.
- Why can't you just drag icons from the description rather than from the bottom area?
- The relationship between the write up and the icons is unclear.
- EOSView is confusing as to what are images and what aren't. Needs to have some sort of indication as to what is a image and what's not.
- Does the color bar slide?
- Can I customize the order of the images in the loop?
- Same name on all windows on SWB.
- can it support a dumb terminal?
- Advertising Service - In “Search Screen” found the labels for links confusing for example: “Earth science and related data” and “Data nad related services.”
- Displaying services at the bottom of the screen was confusing.
- EOSView - When the file is opened, instead of showing “Raster Image...” wanted the title of the image to be shown which makes it easier for identifying images.
- Want to be able to customize the order in which the frames of images are viewed within an animation.
- Wanted the path name on the title of the window.

- Participant seemed to have seen the EP4 prior to the demonstration, or maybe was not too interested in the demo. Asked about the survey and how to make future comments and scores.
 - Question: will the directory setup on my machine? (yes)
 - Adv_Service: the user thought was ADVICE Service - best to spell out the name.
 - The user should not have to know every field in order to search for what they want to find. Search criteria too many and too complicated.
 - Any icon/info to tell you resource usages? Can be a heavy load to the system if the user accesses a large file. How does this issue reflect on remotely accessed data?
 - Abbreviated demonstration - user already used EP4 at home site and answered the IET
 - User Comment - pulldown menu have no icons and icon is not accessible through the menu
 - Bothered by: seems to have 4 different services for the same thing under the Advertising Service. Doesn't want a separate browser for each data set, could there be a more generic browser?
- Advertising Search form and data listing window (service search) are same, no need for data listing (Adv_Service link "Data Sets and Other Products").
- Likes the icon results after the search.
 - EOSView - raster image list doesn't tell what is in each group - not very useful. Text file might help. If not familiar with HDF then don't know what is possible to put in the file or why I need this information.
 - Wanted to stop and read about the Advertising Service on the scrolling window of the Welcome screen because he was initially confused about what it is - not much information on Welcome Screen - will save questions 'till later.
 - Questions about it running on Mac or PC
 - Is Advertising Service the only interface to IMS data? If access to V0, then what is the purpose or value added of using the Advertising Service? Would rather link into V0 from EOS and go directly to data as a V0 user because that is familiar.
 - Not sure what a URL is, have used Mosaic a little.
 - Advertising Search form - what is the difference between ECS and EOSDIS? Search criteria not what expected - thought there would be a map to select location of interest. Criteria too general - Africa is too big especially for ASTER data (60x60) - will get a lot of hits for a continent search. All searches are AND not OR.
 - A lot of questions arise from thinking the query was distributed instead of narrowing down search from general sites/nodes where data is located. Wants all data regardless of who is advertising.
 - EOSView - likes the panning window. Would like a way to view the metadata.
 - History log? Will it eventually be a user thing as opposed to only an operational feature?
 - Comments that users won't read instructions - suggests different fonts and colors to highlight information.
 - Data provider means different things to different people. Maybe call it "archives" because that is a more generic term.
 - Subset = service???? something that is being done, not something you get back. Users didn't think that a subset was a service, rather it was something that you would do to the data, therefore, not an icon that would be returned by the Adv_Service.

- Error out - have to restart - Discussion of instability on Sun. Marti said that she had heard that from someone at a site.
- Help on Acronyms - there is a good list from PDR if that could be downloaded and included in EPs
- Highlighted icons in last column box too big
- Advertising Service - search form layout - align windows to make it easier on eye - follow ECS guidelines?
- Also, not clear where action/buttons are - larger or highlighted would help
- EOSView - list of images, what do the numbers tell you [(306/200). (306/201), etc.]
- Will the intended users know what this is?
- Can you create palettes?
- Zoom buttons words too small - can just have plus/minus or make the word larger.
- Fonts - HCI readability on a screen. - size and consistency between windows. - some fonts are "safe" for porting.
- Background colors can also be independent of platform.

Task 1 Login to the EP4 after reading the scrolling welcome window.

- wants to make the login window and scroll window larger.
- Can the password be changed?
- Can we close one window when more than one are open?
- Used "delete" to delete the service which was dragged from the Advertising Service during the demo.
- Used her own account to login.
- Icons from demo came up need to delete them
- Desirable features: to highlight multiple icons for delete and have key sequences for actions (control keys).
- Cannot delete directory with files, would like a warning or break down of what's in the directory or a mechanism like the MAC to put all of it in the trash and it isn't gone until you empty the trash.
- Whatever you want people to see put at the top of the window because they won't all scroll down to see it.
- Information window font too small, use bold or bullets - fewer words.
- Pictures or symbols should focus attention on the text of scrolling window.
- The Log-in screen should focus on login in, not on "Additional Information."

Task 2 Create two new directories on the Workbench and move two sample HDF files into them.

- In help, how do I go back?
- Shouldn't be case sensitive.
- Can you select both images at the same time?

- How do I go back to the workbench? a bit of trouble to get back to the Workbench window after opening the “help” information.
- Is this case sensitive? most of the users are aware of the unix environment which is case sensitive.
- kind of likes this.
- wants to select both images and drag them at the same time.
- Test Participant seems at ease with pull down menus
- Likes to clean up windows, “can we close this window?”
- Talked her way through menus
- Surprised at placement of folder when moved to desktop. [Participant went to create the “Services” folder by pulling down the “Create Directory” command from the pull-down menu on the MAIN Workbench window. When she created the directory it appeared within the open window displaying the “HDF_Samples” DAAC folders. It may have done this because the second Workbench window was covering, or on top of, the MAIN Workbench window.]
- Deleted “AVHRR Browse” from the Workbench.
- Wanted to select to image icons at once.
- Was surprised that EP4 didn’t let you move directories from one area of ECS leves to the next.
- Didn't open in a new window. Double clicked to open in existing window.
- If I hadn't had any Mac experience I wouldn't have gotten this far.
- No indication of how to go backup.
- How do you get files into folders?
- I would have never, never tried to move the files that way.
- Help is different from workbench - shell shock (sounds like she watched to much ninja turtles!)
- For moving demo images to Demo_Images. Did not recognize the “parent directory” icon for moving to parent directory. Was looking for a “going back” option in the pulldown menu. Could not figure out that “drag and drop” method should be used for moving files in to folders.
- Help should be able to convey more about usage of ECS workbench.
- Don’t like the “go back” symbol.
- Never thought to “drag and drop.”
- Not sure why one would want to do any of this [moving files and creating new directories].
- Is there any navigation information in HELP? It is not clear what is in the HELP function. Why is Mosaic used for the help application?
- Previous excercise was not erased (for moving the two demo images into the “Demo_Images” folder, they were still in there).
- “Open New Window” expected under the File menu. Possibly all OPEN actions with delimiters under the File menu)
- Both windows have the same title, expected a “Workbench.1” “Workbench.2” or something.
- Very confusing that drag service used 2nd button of mouse but image drag is 1st button

- Tried to use the arrow keys to move from folder to folder.
- A bit hesitant (didn't know how to get back to the parent!) should have more (understandable) icon.
- Looked under the tools for "create directory."
- Couldn't go back for the Services at the top level of the Workbench.
- Nice on Mac - can view by name or date, then use the triangle symbol to "explode" folder.
- Created directory from main Workbench but it appears at the lower level of window - confusing!?
- Made the workbench window bigger.
- Did not open as a New Window. Had problems getting back but then couldn't figure out how to move stuff if only had one window.
- Problem highlighting the folder and action (none appeared)!
- Ended up dragging the image into the Icon for workbench.
- Can use the return key - good not to have to hit OK
- Sort of like a Macintosh - good
- Not sure she really had a chance to explore the Workbench! Just created a couple of files.
- Is information under pull down menu showing path really useful to users? Only Unix-wise might even know what it is.
- Double click replaces window but more common in other systems that default to new window.
- Icon to return to higher level directory has no text on it?! A lot of users won't know what this means.
- Change the default same/newwindow defaults to "OpenNewWindow" rather than what it is now.
- Bad "go back" icon.

Task 3 In the Advertising Service search for the Landsat Thematic Mapper (TM) subsetting services.

- Had trouble dragging and dropping into folder.
- Hate that blanking on drag and drop.

CORE DUMP

- No way to tell which window is the main window. Windows should be numbered.
- accidentally execute the application but closed it ok.
- seems they aren't aware of the center button to install an icon on the workbench from the • Advertising Service.- Having a bit of trouble finding the Landsat TM "subsetting" services
- startled by the large black area during the installation of icons from the Advertising Service.
- Hate the black out during the movement of an icon.
- Crashed system, seems like the users are quite impatient when it comes to moving around the icons and installing the services and the drag and drop seems takes a bit more time in the process.
- they want to install all services at once.

- they don't like it when the screen blanks out a bit when moving icons and installing services.
- Likes resizing window ability.
- "too much text."
- Familiar with Mosaic so the window is "weird" in that you can't see linking information at the bottom of the Mosaic window. Also, when you come back all the options are still blue, even the links that were selected by the Participant earlier. Seemed to have to read some of the introductory text over to understand the text.
- Clarify that you can search on Data or on Services.
- Bottom of search window says "icon" and there is only one but direction in test packet says "icons."
- Would be nice to have an "abort" button if the search is wrong or taking too long. [like clicking on the spinning globe in Mosaic to stop the search.]
- Cannot see the linking addresses.
- How to know in which screen the user is?
- The Participant uses Mosaic a lot, tried to compare it with the Advertising Service with it and found that some features were not present.
- Should show status and processing like Mosaic does.
- Likes the logo for the Advertising Service.
- At this point in the usability test the Participant has two Workbench windows open. She re-sized the A.S. window and liked it.
- Would like to see the URL when linking, or when the cursor is over the link.
- Icon didn't drop in to "Services" folder right away.
- Had trouble finding TM data, the AS went down prior to the test so some icons and links were not visible.
- Confused that the links were still blue even when the Participant had already linked to them.
- Wants some sort of search Abort button.
- I would never look in the advertising service to find something. Only if I wanted to advertise something. The name needs to be changed to reflect that.
- If I didn't have the script, I wouldn't do it.
- I don't care where [the data] is, I just want to find it. Didn't like the way the search type listing was broken down.
- When do I single click and when do I double click? Not consistent.
- Difficult time dragging to the workbench. Thought that the description on dragging was ill worded.
- Not sure what I clicked on before. No indication of how I got where I was.
- Requires a multi button mouse. I can't do it on my Macintosh.
- Used the wrong mouse button to drag.
- Don't like the hierarchy of mosaic.

- Wanted different interfaces for Advertising and searching Advertisements or change the name of the Adv_Service to "Search and Adv_Service." or something more relevant. Service Type listing: does not know the different services " and All services enough."
- Found the change between single click and double click confusing.
- Rename the Advertising Service call it Search Services or something.
- Want to search services and data at the same time not "OR."
- Don't care where the service comes from just where to find it that is an attribute.
- Trouble dragging icon to Workbench.
- Choose on button would rather have EP4 look like, or move more towards a Mosaic interface, rather than having different applications and interfaces on the EP4, some Mosaic and some not.
- There are two workbench windows open this caused confusion - discussion of "refresh" feature to show that it is two instances of the same window.
- Screens - the bottom scroll side to side on the Advertising service and the top scroll up and down, it would benice if the two parts of the screen can be sized separately..
- Confusion between ECS and General services when searching by Service Types
- Drag Service Icon didn't work the first time, second time they watched where the cursor position was on the folder. to go right into the folder it has to be open - would be nice if it went right in from the Services window.
- What is the difference between ECS and EOSDIS datasets?
- Technical Term (SQL3) confuses the user, the user might not know what it stands for.
- The menu layout is not immediately understandable. The user spent quite a lot of time trying to find the appropriate tree structure to locate what he wanted.
- The drag-n-drop button isn't really understandable without reading the small text at the bottom of the page. Mac users only have one button so the use of more than one would have "thrown" them.
- The way of "naming things" where the users can go through the tree structure is really understandable, the users have to spend quite time before they would fully grasp the name we use to partition the data and how we structure them.
- Hot list, history table, function that would remember what the user did previously, this would allow a user to modify a subset of information and retrieve the data. User tends to work on similar searches changing one attribute at a time.
- The search form is upsidedown - SQL3 should be at the bottom of the form, not the first choice, it was a bit frightening.
- Want Mosaic to remember the search criteria so that he doesn't have to input them fresh each time.
- Indication of the file was moved or saved to a folder is needed - similar to the Mac highlighting the folder when you drop a file in.
- Advertising Service window - a lot of information to read before scrolling to links.
- User made the Advertising Service window wider, but only a little bit.
- Searched for Landsat 1-5 didn't want to limit the search to Landsat 4 - but it didn't work.
- Also on Mac - icon highlights to tell when the cursor hits.

- Advertising Service to Workbench drag and drop cannot go directly into folder but should.
- Double clicking on links so Advertising Service takes user to other windows than he wants.
- Not too clear on whether he has to search twice to pick up everything
- Didn't know how to use MIDDLE button to drag (found text instructions after task was completed).
- Had trouble going back a layer within the heirarchy - should be a "go back" option in a pull down menu.
- Text too long for introduction to the Advertising Service
- Readability needs to be considered - colors, fonts, etc.
- Does not think everyone is familiar with Mosaic - add note to explain
- Not sure what subset to choose just by reading - what is Landsat ? ECS or EOSDIS?
- Put the "All Data" listing first!
- Trouble constructing a search.
- Can't see the drag occuring or the windoes doesn't light up so to speak. [No indication of data saved to a folder or moved in to activate the EOSView.]
- To find the Advertising Service she went to "tools" on the Pull down menu.
- Can't find "go back." Should be placed under the pull down menu.
- Which level of subset which level of data? The comment was that the user won't really care about what level it is, they just want it. to work.
- May need instructions on Mosaic for those who are not familiar with it.
- Ended up with two workbench windows. Tried to close one and minimized it instead.
- Advertising Service - what does "next Link" mean? Missed the humour.
- Not sure if it would be obvious what service types vs. other links mean - maybe a science users would know.
- ECS service vs General Service is not clear.
- Task instruction is not clear which subset you want
- Would "TM" be clear to the science user?
- No feedback that let's you know that the "drag and drop" worked.
- Instruction is not clear when it says "double click to initiate, drag/drop using middle button."
- Probablem with not being able to install to lower level of workbench - drag and drop right into folder.
- Need more consistency between windows - all instructions in pull down or buttons, etc.
- Is "Service Types" the right wording.
- Wording of drag and drop on Icons not clear.
- Have to go down to the hyperlinks each time you access main page of Advertising Service, this is really annoying.

Task 4 Using Advertising Service find the contact information of the Landsat TM data provided by EDC.

- Took a while but they found it.
- Seems that the users have spent more time to decide which menu path to go down to get what they already know - they had memorized the EDC phone number and were sort of amused that they couldn't just write it down and move on to the next task.
- we should number the workbench windows to tell which Workbench you're in. All the windows having the same name makes for confusion.
- Had to think about the approach for getting this data but got it.
- Having a link from the service to the contact information would be more useful.
- Expected the answer under "TM Subset Services." on a link or in the help.
- Annoyed that there wasn't a link to EDC from the EDC data.
- Subsetting service window select more detail, closed window.
- Path chosen did not give contact information - should be a link from page that tells the user about the tools and data, or the information should be right there on the screen.
- System crashed and the user wondered if the computer would save the results done previous to the crash, it did and user was pleased.
- closed Advertising Service window
- tried to click on folders created from last task. Went to the Services folder rather than the Advertising Service.
- re-opened the Advertising Service. No further problems.
- Is there a way things could be centralized (not have to go back and forth)?
- Crashed when she chose "Pick HERE" to get more information, can't move the window down.
- She was looking in the immediate vicinity for the "contact information" - CENTRALIZE the help or references accordingly.
- Wants things that are associated with one another to be linked in the same area.
- Had to assume ECS from General, not sure all will know that information
- Not obvious where to find information - icon/button/link to find contact from anywhere.
- Won't even necessarily know EDC so search by provider won't do it either -link should be with the data!
- Close button being on the bottom of the initiated icons is not consistent with other windows.
- Not sure where to find the Landsat data (ECS, EOSDIS, etc.).

Task 5 Using EOSView display the contents of an HDF file

- the system does not respond fast enough to the users interaction. Basically some kind of visual aid is needed to signal the user that the system is doing something. I believe that the users are used to the system packages that change the prompt to something like an "hourglass" or "watch" to initiate the action. If the user did not see the cursor change they become impatient and keep on and repeat the same action, which may increase the load on the system.

- “Would like to be able to collapse” the Advertising Service main screen so that the Participant could leave it running but out of the way. Iconify the A.S in some sort.
- Selected image icon and dragged and dropped it on to EOSView.
- Should be able to minimize the Advertising Service window.
- Opened EOSView from Workbench and seemed to be lost. Back to workbench to find the image and open. (there were two EOSViews open at this point).
- Selected EOSView from pulldown menu - then no option for the HDF_Samples - this should have come up as the default. Had to change into the correct directory. When user tried to open that highlighted file by clicking “OK” the system gave an error message, “File must be an HDF file.” User tried it from the Workbench and it worked out OK.
- No idea what the image is or what the image coordinates are
- Need a scale for the color palettes - would like to be able to create own palette.

didn't like the cryptic file name system, the name “5496010A.hdf” meant nothing to the user.

- Was hesitant to close the Advertising Service from the task previous because the user wasn't sure if it would quit the AS or the entire EP4.
- Open EOSView from the Workbench icon.
- Comment about disclaimer on EOSView window - says he's heard that a lot [EOSView is not meant to compete...]
- Found way around directory window with no problems. Displayed image here.
- Likes the windows that show you “go back”
- Default window open up is bad
- Problem with double click default since it works for everything else but here you lose the higher window (ie. can't do drag and drop).
- Lets you work down the levels of the Workbench but not up.

Task 6 In EOSView display a Raster Image group from the previously opened file and change the color palette, zoom and pan around the image.

- Can't read zoom image factor.
- Couldn't get to the four corners.
- Need an escape button.
- Need an hour glass [feedback indicator].
- The seemed frustrated with the panning action in the images the system responded a bit slow and the user can't see an immediate action. These two don't correspond to one another (the large window with the image, and the smaller, postage stamp panning window image).
- An interrupt key or an “escape key” is needed to cancel the action immediately if it takes too long to process.
- Don't like that the Zoom factor is displayed so small in the corner and that the zoom is defaulted to the NW corner of the image, rather than where they'd like to view.
- Didn't know what the “EOSView data file window” was, commented, “Is that what that is??”

- Text too small to see zoom level
- Need a label for panning window...no indication that the map is to be used for panning.
- EOSView content window - no icons - different look and feel than other windows. Can be icons or hyperlinks in appearance? That would make it look more similar to the rest of the EP4.
- Slow on Zoom and Pan - need some sign that something is happening (status line, etc.)
- Not clear on Pan what cursor refers to - assume upper left? Expect Center!
- Would like the "+ Raster Image Group (nnn/nnn)" to be highlighted or hyperlinked in some fashion, this would give the user a visual cue to activate the image by double clicking on it.
- Small letters - user preference

the data listing (HDF) file does not appear to be a click-able item, looks like more regular text. Need to differentiate text so that the user knows immediately that although text is there they are different.

- Speed consideration.
- Not clear that the "+ Raster Image Group" was clickable.
- "Postage Stamp" cursor not in synch with the larger image.
- Would like the geographic coordinates of the image displayed here.
- Likes the panning feature.
- Not sure which files is the "data file window."
- How would "normal" person know what "+ Raster Image Group (306/201)" means?!
- Pan cursor not in sync with image . Needs to be together or users will "grumble."

Task 7 Access an image file and animate it using EOSView.

- No idea how to animate....finally found it.
- Loading should be big instead of down in the corner real small.
- Had trouble with the meaning of the buttons.
- Status information should be big and visible to tell the users what is going on with the images as they load or animate.
- Need an e"scape hatch" from the system/application if something is taking too long.
- There should be an "hourglass" or "please wait" to tell the user that the system is chugging.
- A bigger "Loading" notice is needed so that user's can tell what is going on.
- "Don't know what this means?" - referring to the usability task "Access the image data from the pull-down menu on the file data window [in EOView]. Participant eventually went to the data by going through the folder icon of "HDF_Samples."
- Not sure if animate was working because it was so slow.
- Participant opinion: Only animate if all layers in one file, "Collage" on the MAC can select all files in a directory and animate them at once. If you take the time to link all the files into an animation you might as well make an MPEG.

- Used “drag and drop” to activate the opening of the appropriate data file.
- Very difficult to get around to the layout if you don't have the insight.
- Didn't know about the double click.
- User found the system hard to start - seems like you had to know how to use it in order to use it (EP4 that is).
- Not sure if started from the right window after last task
- Confusing that nothing was selected, not sure what “open” would do. One Participant thought the opposite of the other.
- Slipped off pulldown menu as opposed to select - difficulty with mouse??
- Symbols on animate buttons confused when compared to tape player.
- Participants commented that the system was very slow, better close a window.
- Not sure which would open when they clicked “file - open” from the pulldown menu, the already highlighted “+ Raster Image Group” or a dialog box to give them some file choices.
- The animate button symbols weren't clear.
- When playing in the forward direction the status line says “Forwards direction” should this be Forward?
- Double click on selection works, not as in task 5.
- Need ID of granule name, date, etc. for ordering purposes - if this is to be an aid to ordering.
- If this will be integrated into the ordering system provide ordering information with the visualization package.
- File list in window too small, can't make it bigger
- Can't figure out how to move up to other directory
- User keeps minimizing windows to back out.
- The File-Open data selection window closes up/shrinks after re-sizing
- The file-Open data selection window is too small. Not sure what she did to get to the SSMI_movie.hdf from the MSFC folder but she did!
- Seemed to enjoy the animation.
- Wanted to find the command on the pull down to animate.
- Got error message from the file filter window when selected a file to view.

Task 8 Connect to the RRDB (URDB) and find the number of URDB entries with the keyword EP.

- Hard to read text in RRDB.
- Need user defined sized fonts
- The users seemed more comfortable with the “normal” MOsaic environment.
- The URDB home page needs a new icon, it is just too confusing and small.
- The users were always clicking twice and then bringing up two copies of applications (Mosaic, URDB, etc) then they were confused and somewhat annoyed when they had extra copies.

- There are “roughly 30” entries with EP in them.
- Search on Summary - EP and searched on Detail - EP and got two different numbers.
- RRDB should be named suggestion box.
- Didn’t know the differences in the various types of reports offered by this part of the URDB Search Interface - “Full Report, Summary Report, and History Report.”
- URDB is not good, it should be renamed to “suggestion box” or something like that.
- Acronyms on menu are cryptic - URDB and EDHS - unless you know what they are. Like the idea of “suggestion box” rather than URDB.
- Likes icon on the URDB Screen although they think it is a little optimistic (globe -> URDB -> ECS).
- First part of screen was confusing
- scroll down to get to keyword search - ERROR.
- Doesn’t like the URDB acronym.
- Searching on keyword was no problem
- Cannot see purple link on URDB window
- Cannot find way to search using pull down menus
- Not sure what question (#EP in DB) means
- Once found URDB general screen, he could do the search.
- Would not normally look at top for total number of entries in EP that fit the criteria Keyword = EP, but it’s good there.
- Because she knows mosaic, she knew to click on the text - need to add text to explain, comment on the task!
- IS there a wildcard option for the URDB search interface?
- Keyword that didn’t show up at the bottom of the entry in the list of keywords.
- Workbench default size returns even if re-sized by user before doing some function.
- URDB - moved to new location - didn’t see the link initially
- Stop is confusing on the same line with “Submit” button, an HCI problem!
- Difference in closing a lot of windows tends to be confusing - even though its accepted that they come from different packages. Concern about different COTS packages with their own HCIs.

Task 9 Please enter your comments in the User Survey (IET) and complete the Exit Survey.

- General EP comment: “Looks great - now I have to play with it!”
- There were questions about functions on the EP4 in the IET survey that I didn’t even try.
- Knew that “drag and drop” was there but not sure how intuitive it would have been to someoneelse.
- “didn’t really construct a query in tasks as asked in one of the IET questions.”
- Didn’t realize that there was a “Next Page” on everything.

- Didn't really read everything as much as I would have when I play with it.
- Didn't say "saved" when done.
- Couldn't see the comments when they were scrolled.
- Had to go back to try looking at something in EOSView but there was a core dump - to see if you could see metadata like "browse-arama" on Mosaic.
- pointed out that "drag and drop" feature is not intuitive if one does not read the online help.
- Can't clear areas of the User Survey if you enter an answer you don't want.
- didn't know that each page had a "next" key. Wondered why there were no scroll bars.
- Some questions weren't applicable because they weren't included in the usability tasks.
- Doesn't like how the questions "disappear" when you re-size the comment window.
- Went back to review the system before answering all the questions.
- No confirmation that the data was saved.
- Confusion since last task was in Mosaic and Workbench is mosaic-like, it seems you could back out to workbench and you really can't - picked up on lighter background color of the screens.
- IET Question on help - since not used had to go into it to check.
- Need Feedback when information is saved.
- Comment panel can be re-sized which is great, but then the question part of the screen has no scroll bar to get to questions that disappear.
- Would be nice to have survey in the real system with a button to the suggestion box.
- Two workbench windows which will exit??
- No scrolling bar on window! Missed next/previous page on everything the first time through the IET.
- Didn't use help (my thought - since it asks about help, maybe we should have part of a task that leads them to use it.).
- What is meant by "Layout?"
- didn't notice that icons are placed alphabetically - easy to understand but not familiar - usually places OC icons based on their frequency of use.
- Impressed with the speed of the EOSView animation.
- Mosaic is separate invocation?
- She filled out the online survey
- Things should be more centralized. People get used to looking for things in one place - too many interfaces - distracting. Pull down menus, scroll bars, mosaic - etc.
- Langley is more visual
- Easy to invoke things, but getting back to them is more difficult.
- In survey, heading changed but she didn't see it.
- More visual help needed - perhaps an image of the screen with arrows identifying parts of the screen and giving help within the Help application.

- Would like the Mosaic buttons in one place - the top or bottom of the page. Otherwise it is distracting to the tasks at hand.
- Survey categories at top seem to be odd once you complete a page of questions and have to go back to top of page to move on. Comment box doesn't say "comments."

Appendix B. Exit Survey Results

Results of the Usability Test Exit Survey. Test Sessions numbered 1a, 1b, 2a, 2b, etc. contained more than one Participant. Each Participant was asked to submit an exit survey.

Test Session	Question 1.1	Question 1.2	Question 1.3	Question 1.4	Question 2.1	Question 2.2	Question 2.3	Question 2.4.
	Have you read the EP4 brochure?	If yes, was it useful (1 not useful-5 useful)	How long have you used EP4?	Did you have any experience with EP3?	Which software have you used and are familiar with?	Are you familiar with Mosaic, how long have you used it?	What type of computer do you use most by computer and task?	If you use a Mac or PC is it equipped with a 3-button mouse?
1a	No	n/a	1 hour to 1 day	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, FTP, Mosaic/Netscape	Greater than 1 month	HP Workstation for image processing, data processing, FTP, Mac for wordprocessing and email.	No
1b	No	n/a	Less than 1 hour	No	text editor, word processor, file manager, spreadsheet, email, FTP, Mosaic/Netscape	1 day to less than 1 week	SUN IPX workstation for wordprocessing, GIS, spreadsheet, Informix (RDBMS)	No
1c	No	n/a	1 hour to 1 day	No	word processor, spreadsheet, email, imageprocessing software, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	Mac Quadra	No
2	Yes	5	Less than 1 hour	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	SGI for dat processing, image analysis, email, FTP, Mosaic. MAC for spreadsheet, and report writing/document writing	No
3a	Yes		Less than 1 hour	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	Mac - wordprocessing, spreadsheets, graphics, SUN for X-applications, Mosaic	No
3b	No	n/a	Less than 1 hour	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	Mac for everything - wordprocessing, Mosaic, graphics, scheduling, email, FTP	No

Test Session	Question 1.1	Question 1.2	Question 1.3	Question 1.4	Question 2.1	Question 2.2	Question 2.3	Question 2.4.
4a	Yes	4	Less than 1 hour	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, FTP, Mosaic/Netscape	Greater than 1 month	Mac for email, spreadsheet, word processor, Mosaic, SGI for programming and FTP	No
4b	No	n/a	Less than 1 hour	No	text editor, word processor, spreadsheet, email, Mosaic/Netscape	Greater than 1 month	Mac for text editor, word processor, spreadsheet, email, Mosaic/Netscape	No
5	No	n/a	Less than 1 hour	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	Mac for wordprocessing and terminal emulation, DEC station for data analysis and Mosaic	No
6	Yes, browsed through		1 hour to 1 day	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, FTP, Mosaic/Netscape	Greater than 1 month	SGI Workstation for software development, email, FTP text and graphics, Mosaic, Mac for wordprocessing, spreadsheet, graphics	No
7	Yes	3	1 hour to 1 day	No	text editor, word processor, file manager, spreadsheet, email, Mosaic/Netscape	Greater than 1 month	PC for text editor, word processor, file manager, spreadsheet, email, Mosaic/Netscape	Yes
8	No	n/a	1 hour to 1 day	1 hour to 1 day	text editor, word processor, spreadsheet, email, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	HP Workstation for email, mosaic, wordprocessing, FTP	n/a
9	Yes, but only to skim functions	5	Less than 1 hour	No	word processor, spreadsheet, email, imageprocessing software, Mosaic	Greater than 1 month	Mac for statistics, wordprocessing, graphics, Mosaic Workstation(SUN) for imageprocessing.	No
10	Yes	5	1 week to 1 month	1 hour to 1 day	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	PC - email, Mosaic, FTP, Graphics, OA Workstations(HP, DEC, SUN) - system test and integration, FTP, Mosaic, DCE, ECS applications	Yes
11	No	n/a	Less than 1 hour	No	text editor, word processor, file manager, spreadsheet, email, imageprocessing software, stats packages, FTP, Mosaic/Netscape	Greater than 1 month	PC-wordprocessing, mail, excel Workstation - email, FTP, testing	Yes

Appendix C. Survey Questions

Users will be asked to answer based on the amount with which they agree or disagree with each question. A Likert scale of 1 (Strongly Disagree) to 5 (Strongly Agree) will be used to quantify users' response. Below are the IET survey questions.

General

- 1) Navigation through EP4 is easy.
- 2) The EP4 window layouts are easy to understand.
- 3) I like the way the EP4 help function is implemented.
- 4) The help information provided for EP4 is instructive.
- 5) My experience using EP4 was positive.

Advertising Service

- 1) Navigation through various levels of the Advertising Service was easy.
- 2) I like the multiple methods (hypertext, text search, and attribute search) provided for locating services and data in the Advertising Service.
- 3) Providing multiple methods of locating services and related data is useful.
- 4) It was easy to construct a query for advertised services.
- 5) The ability to search for advertisements with Mosaic, is an important aspect of the Advertising Service.
- 6) The Advertising Service provided enough information for me to determine which services I should install on my Workbench.
- 7) The method used to install new services from the Advertising Service to the Workbench is easy to use.
- 8) The Advertising Service is easy to use.

EOSView

- 1) The EOSView HDF file window displays the file's structure clearly.
- 2) It is easy to select individual components (raster images and scientific data groups) of HDF files and view them as pseudo color images in EOSView.
- 3) Panning and Zooming of pseudo color images in EOSView is easy.
- 4) The ability to select different color palettes for the pseudo color image display was useful.
- 5) The EOSView animation capability is useful.
- 6) The speed of EOSView animation was adequate.
- 7) Help information/instructions provided for EOSView are understandable.
- 8) The EOSView window layouts are easy to understand.
- 9) The functionality (animation, panning, zooming, etc.) provided in EOSView is adequate for my needs/uses.

10) Overall, I found EOSView easy to use.

Workbench

- 1) It is easy to invoke EP4 functions from the Workbench.
- 2) It is easy to start functions using the "drag and drop" feature.
- 3) It is easy to create new directories and move files around to organize the Workbench to suit my needs.
- 4) The Workbench layout is easy to understand.

Appendix D. Raw Survey Scores

The following tables contain the survey scores from the Registered Evaluators and the Guest Logins.

Registered Evaluators

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
date & time	General					Wk be nc h				Advert_ Service								EO SV iew										
Feb 23 1995 6:03:00:000PM	4	4	3	3																				4	4	3	4	
Jan 25 1995 3:38:00:000PM	4	4				2	2	2	2	4	3	4	2	2	2	2	4	4	4	3	3	4		4	4	3	4	
Jan 31 1995 10:46:00:000AM	2	3	3	3	3	2	3	3	2	4	2	2	2	2	3	2	3	2	3	3	2	3	2	3	3	2	2	
Mar 6 1995 11:58:00:000AM	3	4	3	4	4	4	4	4	2	4	4	1	4	3	3	2	2							3	1	3	3	
Feb 28 1995 11:36:00:000AM	2	2	3	3	3	2	3	4	3	4	2	2	3											4	3	4	3	
Mar 6 1995 7:28:00:000AM	4	4	3	4	3	4	5	5	4	5	4	5	4	1	4	3	4	3	4	3	3	3	3	4	4	4	4	
Feb 13 1995 3:54:00:000PM	2	4	2	2	3	1	3	4	4	5	4	4	2	4	3	3	4	4	2	3	4	3	3	4	4	2	3	
Feb 27 1995 11:37:00:000AM	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1	2	1	1	1		3	1	2	3	2		3	
Feb 24 1995 1:59:00:000PM	4	4	4		4	3	4	5	3	5	4	3	5	3	4	3	4	4	3	3	4	4	4	4	3	4	3	
Mar 2 1995 5:05:00:000PM	4	4	3	5	5	2	5	5	2	5	2	5	4	4	4	3	5	3	3	3	3	2	3	5	5	4	4	
Feb 27 1995 2:44:00:000PM	4	3	4	4	3	2	3	3	2	5	2	2	3	4	4	4	3								5	5	5	5
Mar 1 1995 1:55:00:000PM	3	4	3	3		4	4	4	4					3	2	2	3							4	4	3	4	
Feb 7 1995 4:04:00:000PM	4	4	3	2	4	4	4	4	2	5	3	3	4	3	3	4	3	2	2	3	3	4	3					
Jan 20 1995 6:31:00:000PM						4	4	4	3	5	4	4	4															
Feb 28 1995 6:47:00:000PM						2	3		1																			
Feb 1 1995 12:11:00:000PM										5																		
Feb 16 1995 10:12:00:000AM	4	3	4	4	3	4	2	3	3					5	5	5		5	4	4	3	5	5		4	4		
Feb 7 1995 8:50:00:000PM	3	4	3	3																								
Feb 28 1995 10:56:00:000AM	2	3	4	4	3	3	2	3	2	5	3	3	2	1	3	4	3	3	3	3	4	2	4	3	3		4	
Mar 1 1995 9:50:00:000AM	5	4	5	5	5	5	5	5	5	5	4	5	4	4	5	4	5	5	5	5	5	4	5	5	5	4	4	
Feb 15 1995 1:48:00:000PM	3	4	3	4	4	3	4	4	4	5	4	5	4	2	3	4	2	3	5	4	4				5	5	4	4
Feb 23 1995 5:12:00:000PM	4	4	4	4	5	4	5	5	5	3	5	5	5	2	2	3	3	3	3	2	1	3	2	5	5	5	5	
Jan 17 1995 8:46:00:000PM	5	5	5	3		5	5	5	3					5	5	5	5								5	5	5	5
Feb 15 1995 7:46:00:000PM																									4	1	4	3
Feb 22 1995 11:06:00:000AM	4	4	4	4	4	4	5	5		5	3	4	3	2	4	1	4	3	3	2	2	2	4	4	5	4	3	
Feb 15 1995 1:38:00:000PM	3	4	3	3	3	4	3	4	4	4	3	4	4	4	4	2	4	4	3	4	4	3	4	3	4	3	4	
Mar 2 1995 4:42:00:000PM	4	4	5	4	4	4	4	4	3	5	4	5	4	2	3	4	3			3	4	3	4	3	4	4	3	
Feb 22 1995 12:15:00:000PM	3	3	2	2	3	3	3	3	3	4	2	3	3	3	3	4	3	3	3	2	2	3	2	2	2	2	2	
Mar 3 1995 2:36:00:000PM	3	3	2	3	3	3	3	4	3	4	2	4	3	2	3	4	4	4	4		4	4	3	4	4	4	3	
Feb 1 1995 4:19:00:000PM	1	2	3	2		3	3	3	1					2	2	1	2								2	3	3	2
Feb 23 1995 8:19:00:000PM	4	4	4	4	4	4	4	5	4	5	4	3	4	4	4	4	5	5	4	4	4	4	4	4	5	4	4	
Feb 28 1995 2:48:00:000PM	4	4	4	3	4	4	3	3	2	4	4	5	4	3	4	3		4	2	2	3	3	3	3	5		3	
Feb 28 1995 9:47:00:000AM	4	4	4	3	5	3	4	5	3	5	2	5	5	4	4	2	3	3	4		4		4	5	4	3	4	
Mar 3 1995 4:16:00:000PM	4	4	3	3		4	4	4	4					3	4	4	5								4	4	4	4

Mar 1 1995 2:11:00:000PM	4	4	4	3		5	5	5	5					3	3	3	4	4	5	3	3	3	3	5	1	5	5
Feb 17 1995 7:51:00:000PM	4	4	3	3	3	3	5	5	4	5	3	4	4	3	5	2	3	4	2	1	3	2	3	2	3	2	4
Feb 21 1995 5:02:00:000PM	4	4	3	3	3	4	4	5	4	4	4	4	4	4	4	2	4	4	1	2	3	2	4	3	3	3	3
Feb 21 1995 9:44:00:000AM	4	4	4	4		4	4	4	3					4	5	4	3							4	4	4	5
Mar 2 1995 2:37:00:000PM	4	4	3	3	4	3	4	4	3	3	3	4	3	3	3	5	4	5	5	4	3	3	5	4	3		3
Feb 3 1995 7:11:00:000PM	3	3	4	4	4	3	5	3	4	3	3	5	3	3	3	3	2	5	4	4	4	2	4	3	5	5	5
Mar 6 1995 12:01:00:000PM						2	3	2	2																		
Feb 27 1995 9:48:00:000AM	3	4	4	4	3	4	4	4	3					3	2	4	3	1	1	4	4	3	3	2	2	4	3
Feb 8 1995 3:55:00:000PM	4	3	4	4	4	4	4	4	3	4	3	3	3	3	3	2	3	3	4	3	3	4	3	4	4	4	4
Feb 28 1995 4:26:00:000PM						4	4	4	4																		

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Minimum Score	1	2	2	2	3	1	2	2	1	3	2	1	2	1	1	1	1	1	1	1	1	1	2	2	1	2	2
Maximum Score	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	5
Average Score	3.5	3.7	3.5	3.4	3.7	3.4	3.8	4.0	3.1	4.4	3.3	3.8	3.5	3.0	3.4	3.1	3.4	3.4	3.3	3.1	3.3	3.0	3.4	3.8	3.6	3.7	3.6
Standard Deviation	0.9	0.6	0.8	0.8	0.7	1.0	0.9	0.9	1.0	0.7	0.9	1.1	0.9	1.0	1.0	1.1	1.0	1.1	1.3	0.9	0.9	0.8	0.9	0.9	1.2	0.9	0.9
Number of Responses	38	38	37	36	29	40	40	39	39	29	30	29	29	35	35	35	33	26	27	25	28	26	26	37	36	33	37

Guest Login Survey Scores

Jan 18 1995 2:33:00:000PM	5	3	4																								
Jan 20 1995 3:50:00:000PM														3	4	5	2	5	2	2	5	2	4				
Jan 23 1995 3:34:00:000PM						4	4	5		5	5	4	4														
Jan 23 1995 4:58:00:000PM						4	4	3	3	4	4		4														
Jan 24 1995 1:31:00:000PM	4	4	4	4	4																						
Jan 25 1995 3:50:00:000PM	2	2	4	3	2									5	4	1	1	3	1	3	2	2	2				
Jan 25 1995 4:40:00:000PM																								3	4	3	3
Jan 27 1995 7:28:00:000PM	3	4	4	2																				4			3
Jan 27 1995 7:29:00:000PM	4	3	4	5																							
Jan 27 1995 7:36:00:000PM														3	2	3	3							4	3	3	2
Jan 31 1995 3:22:00:000PM						4	4	3	2	3	2	4	3														
Jan 31 1995 4:11:00:000PM						4	4	5	2																		
Feb 2 1995 1:33:00:000PM	2	2	3	2																							
Feb 2 1995 3:39:00:000PM	2	3	3	2	3	1	2	5	5	3	1	1	3	4	3	4	1	5	5	3	4	5	4	4	1	5	2
Feb 3 1995 9:55:00:000AM	5	4	4	5	4																						
Feb 6 1995 4:12:00:000PM														1	3	3	3	1	1	1	1	3	1				
Feb 7 1995 1:42:00:000PM						4	4	3	2	4	2	3	1														
Feb 8 1995 4:43:00:000PM	3	3	3		4	4	4	4	3	5	4	3	4		5	2	4	4	5		3	3	4	4	5	5	3
Feb 9 1995 11:41:00:000AM														4	4	3	3	3	4	4	4						
Feb 9 1995 6:46:00:000PM	4	4	3	3		3	2	4	2															4	4	3	5
Feb 10 1995 4:59:00:000PM	2	3				2	3	3	3					4	4	4	4							5	5		
Feb 13 1995 6:51:00:000PM						4	5	4	3																		
Feb 15 1995 6:57:00:000PM																								4	4	4	4
Feb 16 1995 4:30:00:000PM	3	3	2	3	4					5	3	2	3	4	5	5	3							4	3	5	4
Feb 16 1995 7:05:00:000PM	4	3	4	3										4	2	2	2										

222-TP-004-001

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Appendix E. Raw Free-Text Comments

These are the free-text comments entered in the IET by Registered Evaluators, Guest Logins, and Usability Test Participants. They are organized by function: Advertising Service, EOSView, General, and Workbench.

Function	Comment
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Advertising Service

I found the Adver Serv to be very confusing--I was looking to EP4 as a means of bridging the gap between concepts that I clearly understood (like search for data based on attributes) and concepts that were vague (like services and advertisements).

The Ad Ser does not make things any clearer--for instance, it is not at all clear what one chooses to do say a simple V0 type search--I eventually figured it out, but it was not at all intuitive--I'm sure this will improve as I become more learned

Q2: On second try through EP4 I disliked the multiple methods even less than the first time, especially since they dont really seem to do the same thing. Why doesn't choosing a search service through service types produce the same result as search through advertisements ? It is still very confusing to me how to do a simple V0 type search--- Q6: Once I found the appropriate items--installation was clear.

Upon choosing Search Services , I noticed that the valids lists are not linked with each other--what will be the release A situation ?

The first sentence in the dialog box does not make sense (it has some extra words -- " Advertising Service is to you to search".

When you return back to a previous window using the Back button, the window is positioned at the top of the window instead of where you last left it. It should be in the same position so that it is easy to pick up where you left off.

Using an IBM POWERserver 320, when you are dragging an icon to install on the workbench, the cursor is delayed by a second or two and then jumps great distances. It is very difficult to position in the workbench space.

I do not see this occurring when I use my Macintosh so this may be hardware dependent.

When dragging an icon using a PowerMac using MacX, the cursor disappears completely and the only way you can tell where you are is by the window being highlighted.

When there was a problem with the Advertising Service around the end of January, I received the uninformative message "Operating-system error: Connection reset by peer DB-Library:Read from SQL Server failed."

Also, at times I would get an empty window with the buttons at the bottom, but no text. It might be nice to have an informative error message stating something like "Advertising Services unavailable. Try again later" if this is a problem that is likely to occur again.

We remote users need the icon to be highlighted once you have double clicked on it. It is hard to tell if you have successfully launched the application and you end up double clicking it again because the delay can be so long.

Whether you need to double click or single click can be confusing (single click text and double click to launch icons). If you accidentally double click on text you can end up going down 2 levels because it may send the second click to the next screen and if there is highlighted text there it will select it.

The time to access a particular screen can vary dramatically. From the ECS Data Set Listing Window, to bring up the Landsat Thematic Mapper Imagery window can take anywhere from 1 minute, 20 seconds to 15 seconds using the same display device, just on different dates. When it was slow, bringing up each service icon took about 15 seconds each.

Time for remote users at times can be a premium. There should be a way to allow the user to customize out the time hogs such as the "pretty pictures". Would it be possible to select simplified icons also? Remote users will need ways to allow quicker access to the data that you really want (especially if the system slows down as more users access it and the number of data selections increases).

Sometimes when you resize the window and shrink the width, some of the text goes off the right edge (it is not resized properly). I noticed this with the data set description windows.

The help feature could be improved by making it smart enough to know where you are and giving you selections based on that as well as a general help. For instance, when you bring up a selection, you are greeted with choices such a Browse, Search, Subset and Transformation.

To a first time user, these words don't mean much. It would be nice to have a help at this point that would define these words and tell the user what they could expect if they traveled down each selection.

In the Search through Advertisements, Earth Science Data and Related Services, the window cannot be resized so that the Platform subwindow fits completely on a 16" monitor. There is no way to scroll down that window (it is off the right hand edge).

When are doing any Search through Advertisements, the Search should remember what was selected before the Submit button was pushed. That way one could modify a search that was already done. A Clear selections button would need to be added.

In Search through Advertisements, need a way to select several nonneighboring items such as Temperature and Pressure without selecting all of the items in between. Also need a way to deselect an item without making another selection in the same subwindow(for instance accidentally select Africa and then decide to search over all locations instead - there is no way other than selecting them all or starting the whole process again).

Location needs a way to specify a lat/long window as well as geographical areas. I have never wanted data just over a specific geographic area, but have routinely used data in a latitude band around the globe (for instance +/- 20 degrees in latitude) or to pick a window around a certain location (for instance 68 - 72 degrees latitude and 150-190 degrees longitude).

The term Search through Advertisements did not indicate to me what it was (until I explored that area). A help file that explains the terms and what you can do with each is needed very much.

In the Search through Advertisements, need to have Submit and Reset buttons at the bottom of the screen where they can always be seen instead of needing to scroll to the bottom of the window each time.

In the Subset Search form, does setting various selections return to you only information within those selections, or does it return to you information that there is data available within the selections you requested? In other words, does it do any "trim In other words, does it do any "trimming" of the the data available?

Will it be possible to do temporal and spatial subsetting at once (for us, time is just one more dimension). Currently, it looks like they are exclusive.

When you return to the opening menu of the advertising service, it brings you back to the top of the window instead of the point that you launched from.

Since the text covers more than one window-full, and it brings you back to the beginning, you need to scroll down to continue using the advertising service. It's inconvenient.

Under the 'service types listing', what is the difference between ECS services and EOSDIS services? I thought ECS was just the infrastructure implementation of EOSDIS and that their services are essentially the same.

It's a pain to have the search services form be greater than one screen. I had to keep paging up and down to check things. If the form is larger than one window, may it could be brought up as multiple windows so all of it could be viewed simultaneously.

The navigation sometimes seemed to be very cumbersome. You had to go down one layer at a time. Is there a way to present things so that you can go down one layer at a time and also skip right down to the point of interest - jump several layers? Initially it's good to have it one layer at a time, but more experienced users don't need to go so slow.

Can help be added to the search services form? I had no idea what a Z39.50 protocol is. Help on other parameters would be useful also. Maybe you could hyperlink into the guide documents? i.e. Albedo, charged particles, buoy, etc

Help on what subsetting does would be helpful.

Did not do the query, just used point-and-click 7. Middle button inconsistent with drag in Workbench

2. double-click on text is inconsistent with both single-click on text in Mosaic and double-click on icon in workbench.

3(1) (a) The relationship between the methods of navigation is not always clear. It would be useful to provide a link off the initial page that would provide a roadmap for navigation. The result of the current navigation is that it is easy to get lost--that is, you can tell where you are but not where you came from, and not always where you are going.

(4) (a) Protocol and query language are meaningless to most users; rather a link to an "expert-level" form with these additional fields might be preferable.

(b) all the acronym values had the corresponding spelled out value below. Just an artifact of the db? If not, they should be single items like: AVHRR (Advanced Very High Resolution Radiometer)

(c) the valids are not dependent, leading to high probability of no-hit searches. This is a well-known problem with WWW searching, and suggests the need for rethinking the whole search paradigm (more details available on request).

(d) I was unable to deselect a platform I selected by mistake.

General: (a) Text to link ratio is too high; paragraphs are too long for a computer application (need to be shorter than when on paper). Also, would prefer not to have to scroll down to get to the links.

(7) Middle button drag is inconsistent with left button drag in workbench. Also, those of us with Macs (MacX) are at a disadvantage, though it is still possible to drag. Extremely ugly though.

(c) Keep logos and other inline images as small as possible to still be readable--they take up valuable space that could be used to prevent having to scroll way down to the submit button.

Search services form: It would be desirable to have the ability to submit the search request from the top of the window. In many instances, it is possible that the desired search parameter is entered at the beginning of the form. The user should not have to scroll to the bottom to submit the search.

Spell out adv_service

The use of a Mosaic type of interface works very well for the advertising service. The ability to search dates/times/keywords will be very useful for isolating information. I don't think the user needs to know the the protocol and query language used in the search.

In the Searching for Advertisements window, the first paragraph advises the user to "go to the bottom of this form" and typing in the search parameters. It might be less confusing to tell them to go "to the box below labeled TEXT".

By saying the bottom of the form, that could be interpreted as the bottom of the window. I don't know yet what it is for, but there is a large area in the window, above the Back/Home buttons, which could be thought of as the area you are telling them to enter the information. I know, it's a nit.

In the Earth Science Service Search Options window, I find this sentence: For example, a Search class exists which contains all services which relate to searching for lower level details about data sets that are not contained in this advertising service. Huh? This is an example of tech-speak which could be made more clear.

In the Search Services window, et al, the Help button is at the bottom of the window. In the other windows, such as the initial start up window, the Help button is on the upper bar. Should be consistent.

In the search services form, I didn't understand the difference between a General and an All. Or what they were. From the previous paragraph, I think these radio buttons dictate the level of search. But that still didn't tell me the difference between General and All.

Related to the above, I clicked on the Help button to try and find out for myself what General and All mean. I got a Mosaic window, but it was targeted at my home page, rather than having Help information in it. I repeated it a few times with the same results.

The opening paragraph in the Search Services form says to fill in the following fields. What if the user doesn't know one parameter. Do all fields have to be filled in to perform the search? Based on the first paragraph, that would be my assumption. Search Services parameters have Date and End Date. Should this be >Start< Date and End Date?

In the final product, the valids windows and the text entry boxes should be aligned somehow. Perhaps the various boxes, et al, may not have been aligned in EP4 as a conscious decision to save time. I'd applaud that!

As long as it is recognized that the final product will need to look better than this jumble in the prototype.

There is no text to tell the user how to select a range of valids, or multiple valids. It may be in the Help file, but I couldn't access that (see above). But I think it is a very good idea to use a selection paradigm which is the same as that used in Windows, which allowed me to figure it out.

I submitted a query, and it didn't find any hits. So I hit the Back button to return to the query screen to, as EP4 recommended, try again. But all my earlier choices had been reset to the default, which was everything blank. I think it would be better to leave the persons choices as they were. This saves having to re-enter a large number of new parameter choices that are identical to the old ones, except with one or two minor changes.

I went down into the Advertising Service/Subsetting Services, and submitted a query for [level=ECS | subsample type = Space]. This should not, I thought, have provided me with any services for temporal subsetting.

The resulting service icons had some spatial subsetting services, but I received the following temporal services: AVHRR 1Km Temporal subset, AVHRR Pathfinder Temporal Subset, Landsat MSS Temporal subset, Landsat TM Temporal subset.

When I select the link 'Journals and their Services', I receive: 404 Not Found The requested URL /Journal.html was not found on this server. Like, bummer, dude.

When a link is initiated, it can take a very long time to get a response. Or you may never get one, if a remote machine or network hangs in a bad way. As in Mosaic and Netscape, our eventual system should include a way to interrupt the query and cancel the hyperlink attempt.

6pm I tried TRANSFORMATION. It made a big promise of universal transformations but I didn't understand the instructions.

EOSDIS Search/General Services were non-functional

All Services: List of dataset specific functions was unexpected

DATA LISTINGS: good use of spelling out datasets. Acronyms alone would have been confusing.

Detailed info on Buoy's not found

6:15 Advertisement Search Screen ...It was confusing because I didn't realize the submit button was at the bottom of the form.

Why is ECS the default? What the heck is an OLS (some type of sensor)?

Do I really have to page to the bottom to submit each query? Why do my entries all get deleted after each submission? What happens if more than one entry satisfies the search (My searches were only returning one hit each)?

Distinction btwn ECS and EOSDIS may not be clear to a user. It is also unclear what 'general' and 'all' mean.

Dynamic valids (i.e., reconfigured choices dependant on previously selected valids) should be implemented to guide the user to a valid set of search constraints.

The construction of valids choices is important. By that I mean that either all names are spelled out (with abbreviations in parens) so that there are not 2 choices for the same thing.

E.G. TM and Thermal Mapper are really the same yet appear as 2 distinct choices. It would be good to see some effort in this early on as it is one of the shortcomings of Version 0.

In general, there is too much fine print to wade through on the screen. Most of it could be implemented as help text that a user could invoke if needed. Also, the choices on a given screen are too wordy.

For example, on the initial Searching for Advertisements screen the choices could be simply "services", "data", and "journals".

I'd like to be able to specify my own criteria as well as choosing those provided in the lists.

Under step 21 the message "This server has moved to a new location" comes up. This is kind of klutzy in the middle of testing. Why don't you just send us to the new location?

Service type listings - why are ECS and EOSDIS separate? Headings under each category should have very brief (5 words) description of each service.

For AVHRR browse, couldn't access <http://catfish.hitc.com:1500/Details.html>. Output format HDF should be explained briefly to user (what is it?) .

In text search, what is "relative score" indicative of? For the advertisement search form, users are going to run into problems filling in all the data collection attributes; the entries should be interdependent on one another,

i.e., if someone choses "temperature" in the parameter field, then only those instruments that measure temperature should appear in the instrument field, and so on. Maybe theres a way to do this but I didn't have time to investigate all the options.

Also, in the date and time fields, an example should be given as to the format required for these fields.

Finally, what is the difference between "Services Related to Earth Science Data", and "Earth Science Data and Related Services " categories?

Testing out the advertising service...data sets and other products all data NOAA/NASA pathfinder data in the info there is a icon in the reading it looks like you can just double click on it.

As a non-scientific user I have some questions: 1. What is HRPT data? 2. What is AVHRR Level 1b data or 1B data (both lower and upper case were used, I read lower case as bit and upper case as byte)?

It seems as though there is a lot of repetitious text on adjacent screens.

Documents say for more information initiate the "LINK" option and this will pass you to the EROS Data Center GLIS. I haven't found the LINK option anywhere.

detailed comments were provided to observers; our trial was hampered by slow response time--it would have helped to have messages or icons indicating system was responding while we were waiting;

Finding the order form is difficult. Searching for data is not as easy as the previous version. I cannot find any Pathfinder data, the system says it cannot find any. The system seems to be more of a history lesson in the various projects rather than a tool to order data.

The free-text search function was not adequately explained. When I tried to search for an item, I was put given another text box to enter another search word. I don't know if I tried to enter a word that was not found or what.

Q2. It needs to be better integrated such that the differences aren't so apparent... again, a bit of a shock... I like the idea of having these together... just a little more seamless.

Q6. I didn't really understand this concept. I was confused by the word advertise because I didn't want to advertise a service or data. I wanted to find services and data. It may have just been the words on the screen that made it difficult. Once I got in, I didn't understand the difference between the options... e.g. Earth science data and related services vs. services related to earth science data... I didn't get the difference...

Q7. This is where I got completely stuck trying to do a drag and drop in one step with the mouse. not only did I have to do it in two steps, I had to use different mouse buttons - this was real awkward.

Trying to locate data in the advertising service I find is not very user friendly. There are no help screens anywhere, even at the searching level. There is no information to tell the user if the field needs a specific format (for example, date entries)

The old system highlighted allowable fields for selection based on current selections, this system does not tell you if you are asking for illogical information. A non-scientist will not know if they have made a contradictory or nonsensical choice.

Also, when a search is entered and data is not found, the search parameters are listed but when you back up to the screen all the entries have been deleted. If a typing error was made the whole screen has to be reinput. If the entries were saved only the mistake would have to be corrected.

The Advertising Service is set up well. I like the ability to do a free-text search. This is very useful. It is harder to do a search using the other methods. This is because the other methods seem to want relatively exact attributes to be given. If any parameters are wrong, the user won't find what he is looking for.

I think I'm beginning to get the hang of the Advertising service. For this prototype, there really is not much to see. All the browse services I've tried so far have not been implemented.

My understanding is that the images that at this time can be viewed from EOSView (if it's working) will eventually be available from the Advertising service, at least to some extent. This makes it easier to understand how the system will work when it's finished.

I know this is only the prototype, but without any images to actually find and view, it's hard to get an accurate idea of how hard it will be to do searches. However, from what I have seen so far, if the program works the way they intend to, searches will not be too hard. Of course, if the user wants to use parameter

searching, he or she will need to know what they are looking for. Otherwise I think they will get either too many images or be put in the browse service. This makes sense.

I wonder how many parameters a user could leave blank and still receive images. If more than one image were found, how would the system handle that?

I know these functions are still to be implemented, but they seem to be important to evaluating how easy the system will be to use.

I did have a problem when I tried to follow the "details here" link...I got an error message and could not access the information. It is possible some of what I was looking for was just not accessible.

I need to spend more time looking at the advertising service. First impressions though are generally good. I realize this is an EP so it is not fully populated, but it was confusing at first to read advertisements and then get down to the services level and then it was confusing at first to read advertisements and then get down to the services level and not see any!

Functionally speaking though it seems like a good way to browse/peruse for information. I tried out the WAIS search, where you can search through all of the advertisements, and I didn't like the results that I got back.

Especially when I think about this thing being more fully populated. This is a problem I have with the current V0 IMS, the titles that come back to link on are not very friendly!

I also did a search of the services using the services form and it allows users to create impossible searches and provides results!

Sometimes I was confused about how and when to use the "action" button. The highlight box seemed too big. I didn't try to create new directories. It didn't occur to me that that was an option.

The advertising service was good but I always ended up with the GIF and didn't feel like I had control of the depth of info I would get. I was not at all satisfied with the ADV SEARCH FORM.

1) maybe service type listing should accent "all" as a default since I would not know which service to pick when looking for a particular data set.... or maybe a fuller explanation of what a "service type" is.

2) I like the journal availability, but would not know it is there by the "data sets and other products" title.

3) Can data centers also list the major projects they are involved with?

4) Maybe highlight or bold the word search in the title "search through advertisements"

5) Is it possible to do something like (i.e. maybe a subtitle) "what I know", "what I need"? That is, I know the year and the data type, what I do not know is the data center that provides the data... maybe I'm asking for too much...or maybe put the "search" choice first... or put "when in doubt, choose me" next to the "search" choice

6) data collection attributes: - make "all" the default. - can there be another attribute for special projects like FIRE, SCAR, GALE, etc.? - do you need to put in the dates? - how many of the fields do you have to fill in?

- highlight the "submit" button - when searching for data sets that are NOT on the available list, how does one get them, or submit a request for the data set made available. (e.g. weather balloon data from the FIRE experiment).

The following description indicated that the evaluators did not know, and could not find, definitions for the 4 levels (i.e. EOSDIS, GENERAL, ..., ECS). They did not know whether a subset-superset relationship existed between the levels.

Going through the following sequence: -ADVERTISING SERVICES--SEARCH THROUGH ADVERTISEMENTS--SERVICES RELATED TO EARTH SCIENCE DATA--SUBSET SERVICES FORM
The following group lists the parameters selected from the Subset Services Form window along with the

associated results: -level = EOSDIS-"no services" -level = GENERAL-"no services" -level = ALL-received information -level = ECS- received information This general trend of no services for EOSDIS and General level selections was consistent with other searches. Inquiry: "?? Are these two options linked??"-

The evaluators did not understand, nor could they find, definitions for subsample and subsetting, factors and methods.

Also under Subset Services Form , we found the subsample method and subsample factor options confusing. We feel these require further explanation either in the accompanying literature or in the help menu.

back to the confusion about the levels: We selected a specific data set, ERBE, and tried to obtain information.. We tried a number of different search combinations but were not able to come up with any information.

We selected parameters that we knew to be pertinent to this particular data set. Again no data was provided only a message reading that no services were found. This may be linked to the fact that EOSDIS had no services.

This discrepancy may already be recognized. For us this proved very confusing and, made us uncertain about the implemented procedure to obtain data.

Another feature that was very useful was the listing of submitted search parameters in the "Search Services" window. The accompanying literature and on screen help menus were very clear and informative.

There needs to be help on the screens where actual ordering of data is done and for the menu's in between. In the Advertising Service what is the difference between "Services related to Earth Science data" and "Earth Science data and related services".

It is difficult to say much about the functionality of the Advertising Services since nothing seems to work. It really seems to me that help screens on the ordering page would be helpful. how does one know what EDC is unless you've heard of it before? (People often avoid help screens at all cost)

How do you know where to begin looking for avhrr data? I goto the help on the application - it seems to say nothing about what EDC is or what data I can find under it.

I don't care to have a whole bunch of hypertext on stuff I don't want to read...it looks nifty...but I don't want to read all the stuff in the help to find out about one data set.

I went to the applications help - it seemed to be what I wanted...but it wasn't anything about finding the data I wanted...it told me how to double click on an icon. :(

the ADV_service: I got two of these so I closed them (it should check to see when you have two of something open) DATA SETS (YAY!) (how could I have known to look here?) what are the data set classes? doesn't look like help is available in this window

(It looks like you call the MSS and TM data sets the eosdis data set- eosdis is NOT a data set...now that I've found info on AVHRR data - where do I find it in EOSview? - no info found for it.

For both the search and subset services from ECS,I was not entirely clear on how they would function and the types of input that I would be allowed to give. Specifically will I be able to enter "ozone" and have data sets that include this parameter returned

Along the same lines, will I be able to get the ISCCP C2 data and pull out all of the values related to cirrus clouds. I think that the term subsetting implies the ability to pull out specific parameters or groups of parameters. Based on what I saw in the Advertising service, I was not sure if I would be able to do that.

When dragging and dropping a service to the workbench, by "releasing" it over a folder for example, the service is installed on the top level of the workbench (as opposed to the more intuitive option of placing it

automatically in the folder it was "released" over). If the user wants to install on the top level workbench, the service icon will be released over an open area (not a folder).

I really like the way the advertising service is presented here. The descriptions from the requirements and design documents are not able to communicate the functionality that this prototype can provide.

Even though the scope is limited here the ability to lay hands on this function really helps to bring the advertising service to life. I am concerned about how this interface will be able to handle the advertisements when there are thousands of them out there. It looks great now with just a few entries.

Free text search came up with an entirely different set of documents than the other search methods -- no service icons, etc. While the different search methods were nice, I thought the user should be steered (by default) to a general search method, not to dataset specific search tools, which presume detailed dataset knowledge.

Dataset specific search tools should be aimed at an experienced user.

Once you have a dataset description, it's very useful to have all relevant tool icons available. There seem to be a lot of tools in relation to the number of datasets in this EP. I hope you don't end up with a separate browser for each dataset!

This EP presumes detailed knowledge of the ECS architecture on the part of the user. You may find knowledgeable reviewers now, but your general user community will be confused as to what an Advertising Service is...

Practically every page I accessed said "For more details pick HERE!!", which always led to a dead end. Where is Details.html, and why is there only one details document for everything?

Drag and drop is excellent!

when following the scenario step 29 - double click on icon caused workbench to go away although EIT window stayed up.

re-logged on to ECS and double click worked this time

single click on service types invokes function but elsewhere it takes a double click to invoke function - not consistent and causes confusion

Q4: didn't try to construct a very hard query for adv services so can't say how easy this is really

What exactly are "General Data Sets"?

The Search Services Screen is not shown as on page 13 of the brochure. There is no Sensor/Platform, etc until further down. Why not put Protocol and Query language at the bottom of the screen since the user can't change these attributes.

Also, what exactly is "Protocol"?

Check the grammar on the ESC Advertising Service Page - the first sentence is not correct

What exactly are "General Data Sets"?

The Search Services Screen is not shown as on page 13 of the brochure. There is no Sensor/Platform, etc until further down. Why not put Protocol and Query language at the bottom of the screen since the user can't change these attributes.

Is it possible to print any of the windows so that if a search or order is placed the user has a permanent copy of it? This will help in confirming whether or not the request was filled completely/properly.

When I double clicked on the Adv_Service icon the first time I was bumped out of the system. On subsequent tries, nothing happened.

The first line on the Advertising Services screen has a typo ("The purpose of the Advertising Service is to you to search for services").

Most screens where the document said "For more details, pick HERE", when I selected HERE, the document was not found.

On the "EDC/NOAA Held AVHRR Data Description and Services" screen, the description next to the AVHRR 1KM Search icon refers to landsat data?

Several references are made to GLIS, where and how are you passed through to GLIS?

On the "Searching for Advertisements" screen, what is the difference between "Services related to Earth Science data" and "Earth Science data and related services"?

Services Type Listing page: The meaning of ECS versus EOSDIS is unclear. The meaning of "If you don't care ..." is unclear.

AVHRR 1KM Browse Description: I don't understand the test in the icon window; what is the context of the terms "initiate" and "install"?

You can't easily drag the icon to the Workbench - the windows open directly on top of each other; there should be some kind of offset for new windows so that the user doesn't have to keep moving them around.

Searching for Advertisements: Thank you for adding the "...hitting return" to the instructions for the entry of search text; this is lacking in most similar interfaces (even EDHS).

Search Services Form: The form didn't look like the sample display in the EP4 brochure; it took a while to realize I needed to page down.

Data Listing: The descriptive text is not informative. The list of data set choices is not informative. Is the choice of "all data sets" a practical choice for the real, fully-implemented system?

As I was going thru the science user scripts, before I began to really exercise the Workbench, I had the following problem: Item 24 on pg 3-5, which is supposed to let me launch the ECS Advertising Client, I think. Instead, I got the following message

As I said in my comments under workbench....I cannot get this service to launch. The reason I couldn't launch the adv. service is because I typed 'ecs' and not 'ECS' to run ep4. Although I should have checked on this immediately,

it just did not occur to me that using the wrong command to start ep4 would work at all. And it does work...though not too well. So, its not terribly user friendly to require it to be 'ECS' but have something called 'ecs' which _almost_ works.

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So, its not terribly user friendly to require it to be 'ECS' but have something called 'ecs' which _almost_ works.

3/1/95 Although I like the concept of the advertising service, I don't find it to be as intuitive to use as I would like.

Today, it took me some time to figure out where to go to enter a general search (based on, say, parameter, time period and region). I finally did find it, but I thought it was rather buried. I think this is one of the first things people will want to do.

They will not be able to choose from lists of data set names alone. If possible, make it clearer that to execute a general search, the user must select "Earth Science Data&Related Services" from the Searching for Advertisements page.

3/3/95 Under 'service types', what are ECS services? EOSDIS Services? A novice user or one not familiar with EOSDIS won't know which services they want or need.

Under ECS Search Servicess: I like that this service allows me to select the particular data set and then search for specific granules/Since I am already pretty familiar with satellite data, I appreciate not haveing to construct a query from the ground up

ON THE OTHER HAND,were I a novice user or someone not familiar with these data types, I would want to place a query right away, and its a little confusing how to do that in the advertising service. I had to look thru a few screens to find this capability I don't think many users will come into the system knowing they want a SUBSET or TRANSFORMATION servicee. They simply will want, for instance, surface air temperature, humidity and rainfall data for a particular region and time period.

SEARCH and SUBSET Services Are these linked somehow? A user unfamiliar with this process would search for granules but them perahps would want to subset the granules into specific regions.

The user will not know if she/he wants a granule or a subset of a granule.

do not understand purpose of the advertising service in general. when I tried the search and it did not work it did two things I really hate. First, it blew away the so-called incorrect search parameters.

Second, it did not identify what was wrong with the search in the first place.

I selected 'help' in the advertising service and got the EDHS home page. Not very helpful.

It's not clear whether a user has to select a protocol and query language. Without help you don't know that it's just there as a possibility for the future (I assume?).

In the free text search of all services, it's hard to tell what you're getting back since the result is an HTML pointer. Maybe if that's intended only for expert users it might work, but not for the general case.

In the search form, I'd eliminate the duplicate entries since it left me wondering if there was really a difference (e.g. between 'AVHRR' and 'Advanced Very High Resolution Radiometer'). I suggest using the long name and the abbreviation in one entry.

II. Advertising Services : Upon clicking the Adv_Service button, I clicked once; nothing happened. Of course, it worked great with 2 clicks. I do not feel that this is a problem but thought some users might do that (until trained).

This is somewhat inconsistent with links in Mosaic in that they require only ONE click while icons require two. Hopefully, our users will be intelligent enough to figure this out without too much trouble!

5. ON the AVHRR 1KM Browse Description screen, the HERE link is inoperable yielding an ERROR. Check links or "delink"..

6. On the EDC/NOAA Held AVHRR Data Description and Services page, while there are links, it would be nice if the Icons on the Mosaic part of the page also provided a link to the document.

It is nice to be able to have the documentation readily available by clicking the link and the icon to start the application.

7. The install icon function to local workstation is convenient, instructions concise and correct, easy to use, and works after exiting and reentering the application. GOOD!

? Do all systems have middle mouse buttons these days, are are there still some with just two? IF so, how will you implement the Install?

8. At the dataset screen level, I like that there is a consistent interface among all the AVHRR datasets -- the search engines for each contain browse, generic search and both spatial and temporal subsetting.
9. On the Service Types Listing screen, I like that the user has the option to specify his search (Browse, Search, Subset, Transformation) without having to traverse all the links since some users will know what they want. This seems to deal with the lookers and the more experienced.
10. Please reword the statement: "If you don't care where the services come from, pick:" This is ambiguous. This implies possible lack of quality to me. Don't you mean whether ECS services or 'unmaintained by ECS' services? This also exists on other screens.
11. Since the ECS Data Set Listing page has a link to EDC/NOAA Held AVHRR Data which is also accessible through the Search link at the top level of Advertising Services, LINK management is CRITICAL, to avoid invalid links as stated above in #2.
12. ON the Data Provider Screens, EROS lacks email address - do they have one? Will there be a "standard"(as much as possible) email address for documents and User Services Offices such as: nsidc@eos.nasa.gov or daacuso@daac.gsfc.nasa.gov ? Documents should have same type information for source.

ADVERTISING/ Search Services: Services related to Earth Science data

SEARCH SERVICES FORM: 1. No save query. I lost my query when I went "Back" to another Screen. (Thus why need a RESET button?)

2. My query returned no results, and I was told to "try again" Yet I had no idea what was wrong.
3. Not intuitive on how to choose multiple Disciplines when the disciplines are not adjacent.. No instructions available interactively.
4. Had no idea which Protocol to choose.
5. Is there a "proper" date format or can you use any and the code will translate?
6. NO GRAPHICAL SEARCH (spatial or temporal) CAPABILITIES - will these be added later?

SUBSET SEARCH FORM: 6. What is the subsample factor? -- Help buttons would be HELPFUL on each screen for further field information.

7. I Accidentally hit the mouse on the reset button and cleared the search. Could it be made a Bit More difficult to clear the search (move the button further away from submit, require 2 clicks , a "do you really want to clear?" message < I don't like this option> , or .?) or would this be too unintuitive ???
6. With the "Greater Than" button I was allowed to enter an END DATE. The End Date should have no meaning if greater than or less than is selected.

Earth Science data and related services: 1. Seems to work fine.

Journals and their Services: 1. LINK problem - no URL!

there were some network problems so I didn't get a chance to look at everything. The 'non hierarchical' method of navigating was nice.

I would think the default for double clicking a folder icon should be 'open a new window' - I don't use any other OS/window manager/cots package that in double clicking removes the current window...

there were some network problems so I didn't get a chance to look at everything. The 'non hierarchical' method of navigating was nice.

I found the multitude of SEARCH services very confusing. If you select 'search through ads' from the home page you get one set of options, while under service types there are three things called 'search,' none of which match the 'search through ads.'

A few Details.html are missing...

Having a 'mosaic like' interface to the adserv is great, but it'd be nice to have a sensitive cursor as in mosaic - ie, when the cursor is over a link, the url or command should be show - it helps one decide if it's a link they want.

Also, having links highlighted is fine, but in mosaic (and netscape) once you've been to a link once, the highlighting changes colour - that this doesn't happen in the ad service feels a bit odd, but not critical.

Too often, in selecting options, (eg, in reading about a service), the only navigation options are back and home - it'd be nice to have a few common options at the bottom of each page.

In "searching for advertisements" the text fields says the "database of services" can be searched - *I* think of advertisements as metadata - and wondered what exactly this text field was searching.

I entered reflectance and got one hit - a GCMD DIF describing my data set. But in looking at the description of the EDC AVHRR data the word reflectance is in the a gazillion times (a few anyway) and I suspect it's in some of the other descriptions. Again - I don't know what that was searching.

I like the fact that when you select exit, you do NOT get a stupid confirmation pop-up. Yeah!.

fine except when it crashed; don't like that I couldn't d&d service icon from adv. service window directly into a folder on Workbench window

couldn't find the reference information about a product from within the data description; I had to remember where the data was located, and since I really didn't pay any attention to this(a user doesn't care, right?)it was not intuitive without some work

1) Put up a clock cursor to show me the application is doing something. See mosiac for an example (The spinning earth). These applications are in great need for this feature because of their requirement to go out on the net to get information which takes time.

2) When I return to the home page it does not take me to where I left off. I have to keep scrolling back down to the same location. Can this be fixed?

The concept of an Advertising service may be a good one, but what it actually is confused every user I worked with. Since this is a new concept to the user community, it is important that the explanation on the first screen is clear.

Currently, it is not. There are some typos which add to the general confusion.

2. Searches for data sets were not very successful, in general. For example, 'sea ice' produced hits but 'oceans' did not. One is just as vague as the other so I don't know why one worked and one didn't.

3. When I did a search on sea ice, I got back three hyperlinks. It had a 'relative score' for each item. What is that? Where is it explained?

4. Minor point: the font in the window which lists service name and summary is very unappealing.

5. Why is the general data set listing empty? I expected it to be the same as 'all'. What is the difference?

6. I received the following message:

Requested document (URL <http://catfish.hitc.com:1500/Details.html>) could not be accessed. The information server either is not accessible or is refusing to serve the document to you.

1. navigation through the system is very slow. Several times I could not tell if anything was happening. After clicking on an option or hyperlink, reaction from the computer often takes on the order of minutes.

I don't know if it is the fault of the local machine, the network, or the software. Probably a combination, but the end result is angonizing.

2. I like the look in general. It looks so much like other applications that I am already used to that navigation is second nature. How things function, however, is not. For example, what is the end result for the user when cruising through the adv_servc?

Can she place an order? If not, how then can she go from the information she receives in the adv_service to the ordering process? Am I getting ahead of the game? These are the kinds of questions the users are asking me as they look at it.

1. Looks good overall.

2. I had a problem sometimes with the double click. It seemed intermittent.

1. I had no problem figuring out the file's structure and neither did about half of the testers I worked with. The other half were confused and didn't understand how to navigate without my help.

This is not necessarily a problem as long as there is adequate on-line help.

I'm a bit concerned about the Advertiser. Has anyone considered what the advertiser pages will look like when we have hundreds of data sets and service providers? Will users be overwhelmed by the options?

From the Provider Listing in the Advertiser we can get information about each site, in the future will we also have access to services (i.e., the service icons) provided at each site?

Double-clicking on the service icons in the Advertiser windows has no effect.

use a rubber-band like scheme to pick an area or some more generalized graphical scheme to select area, height, and time region.

A fill-in scheme should also be available to select hyperslabs of data (in latitude, longitude, height, and time). A method should be included to select multiple hyperslabs (eg, both poles) of data.

A method of selecting co-located datasets (an intersection of multiple datasets with a given criteria for overlap) should be implemented. All schemes of data selection must be available on the command line and via library calls.

There were a couple of typos observed and at one point there was a reference to Landsat when we were "querying" for AVHRR, but expect this will all be cleared up down the road...

very nice, I like it. Some cosmetic: it looks nicer to have the arrow changes to a different symbol as you point to any of the services in the window. At the meantime it serves another purpose by indicating to users where to double click (icon or text underneath).

STEP # 29: DOUBLE CLICK ON "ADV_SERVICE" ICON CAUSED LOG OUT W/ERROR MESSAGE "Cannot open the file Adv_Service". Second time was successful.

I do not know how a more complex query will do, I assume as well as the simple one. However, I like it and its very good.

In the earth science service search options why is there an AVHRR and then the explanation for that acronym right below it ??

What format for the date should I use mmddyyyy OR yymmdd ??

How many search criteria IS required ???

Can we have multiple platforms selection ??

What is the purpose of DISCIPLINE. IS the user expected to choose a discipline all the time ???

For this particular release of EP4 it would be helpful to know as to what data sets could be searched for ...

All the submitted parameters DISAPPEAR after the message that no search criteria was met. Would be useful to have the paramters saved since there is a RESET button anyways !!!!

In the subset search form no parameters were found for a variety of searches ...AND all the service attributes are cleared after search criteria was not met ..

What is the difference between Services related to Earth Science Data NAD Earth science data and related services ??

Highlighting a particular attribute should change other parameters in the attribute. Example: If a user clicks earth science first then all the invalid selections in platform, parameter et c.. should be eliminated

(The V0 IMS has a similar feature to eliminate invalid options automatically so the user does not have to go to some other menu to find out what parameters are valid for example LANDSAT or AVHRR!)

Many users are familiar with specific experiments. For example : You could have a campaign/project section with experiments like ERBE, ISCCP, PATHFINDER ...

User must be able to select multiple parameters ..

In order to subset the data particular data it would be useful to have a map of the world and highlight area of interest.

I like the fact that you will be providing subsetting by geophysical parameter ..

Is there some place where I am supposed to specify lat lon bounds for subsetting ??

In the earth science service search options why is there an AVHRR and then the explanation for that acronym right below it ??

General Services (Conversion, Search, and subset) and EOSDIS Services produced null results. Clicking on help brought up a Mosaic interface with EDHS (my home page) on it. Icons sometime did not appear.

When double clicking on Icons, the response time varies and there is nothing indicating that it has "accepted" the double click - once thinking nothing had happened, I double clicked the icon again, and the system crashed.

It is impossible to tell when the software is off doing something. There needs to be an indicator (similar to a clock with hands moving) that an activity is taking place. A % complete indicator (like seen in file transfer software) would be optimal.

When you return to the opening menu of the advertising service, it brings you back to the top of the window instead of the point that you launched from. Since the text covers more than one window-full, and it brings you back to the beginning, you need to scroll down to continue using the advertising service. It's inconvenient.

Under the 'service types listing', what is the difference between ECS services and EOSDIS services? I thought ECS was just the infrastructure implementation of EOSDIS and that their services are essentially the same.

It's a pain to have the search services form be greater than one screen. I had to keep paging up and down to check things. If the form is larger than one window, may it could be brought up as multiple windows so all of it could be viewed simultaneously.

The navigation sometimes seemed to be very cumbersome. You had to go down one layer at a time. Is there a way to present things so that you can go down one layer at a time and also skip right down to the point of interest - jump several layers?

Initially it's good to have it one layer at a time, but more experienced users don't need to go so slow.

Can help be added to the search services form? I had no idea what a Z39.50 protocol is. Help on other parameters would be useful also. Maybe you could hyperlink into the guide documents? i.e. Albedo, charged particles, buoy, etc

Help on what subsetting does would be helpful.

When walking the Hyperlinks, how did "Installing Applications" become "services" on the subsequent page? (This whole "services" page was very confusing.)

EOSView

Q1: EOSView only "displays" raster images--it is unable to help a user find out anything else about the hdf file--why ??? A simple text reader tool is an absolute necessity. Q2: Yes for raster--no for scientific data groups

Q3: The pan and zoom features are very course--there is no indication to me where in the original image I am, also, one should be able to preselect the center of the zoomed output instead of semi-blindly panning along after a zoom.

Q8: The hdf file descriptor window could use a better, more descriptive layout or at least description--there is information displayed which is not identified, such as (720/4) Q9: See answer to Q3

Still not sure what the sds images are---Unless one is familiar with HDF objects, the information is not much help !!!

When I first played around with the zoom capabilities, I had difficulties figuring out how to move the area the area that I was zooming. With other packages, I am used to hitting zoom, having the cursor change to a "zoom cursor" and then indicating the area to zoom by clicking on one corner and then dragging the cursor to the other corner I want. The zoom box is indicated by a dashed line box that travels with the cursor.

When you have a plot that you want to zoom on, you should should have the zoom area center around the cursor. Now it seems to zoom around one edge.

I had one plot window (with the zoom buttons) open once with the title bar above the top of the screen. I was unable to move that window or use the close button.

Eosview animations at times were not a uniform speed. This occurred when the speed was set fairly fast. The animation would freeze and then play catch up by displaying several frames very quickly.

This is understandable when you take into account all that is going on, but I thought I would point out that to remote users, the animations can be less than optimal at times.

Another thought on the way that zoom is designed - It is difficult to repeatedly zoom on a specific feature using the small zoom box. It is hard to see a specific feature, and even more difficult to get the cursor over it to zoom it (especially when you and even more difficult to get the cursor over it to zoom it (especially when you zoom more than once).

The above listed way of zooming allows the user to very specifically zoom just the area desired.

Eosview help - It might be nice to have a separate help that would give a list of selected help topics that one can choose from. For instance, if one wanted to concentrate on zooming or to find out more information on overlays, to have those as separate topics that one could find information on quickly would be nice. It would be nice to have a simple string search capability, so one can find information in the help file more quickly.

Should dim the Page Down button once the bottom of the help file has been hit.

It would be nice to have the total number of pages (or lines) and the location of where you are in the help file. This would allow the user to determine how much information is there and whether to quickly scan it or read it carefully.

Another option would be to have the information in a window with a slider bar.

I *hate* the hmi for EOSView! The type is too small and the navigation wasn't intuitive. I got all confused between 'filter' and 'ok', and once I did it wrong, I was bounced out of the directory. Another way of traversing the menu here is needed. Hyperlinks would be very nice.

It was not good that the ASF .txt files couldn't be read. Either spawn an editor to read them or don't include them! Also, the text files explain what the files contain, and the cryptic file names by themselves mean nothing to the average user.

When trying to view an HDF file, I *hated* the window that was brought up - Document Title - EOSView: filename. It should go directly to a raster image! This step was confusing and tedious.

Once an image was up to view, I was confused about how to zoom and just move around the image. The help here was useless. Using the color palette wiped out my background and was also useless.

Bottom line is that I don't like the EOSView hmi at all!

Drag and drop fn. startup is superfluous since double-click does the same thing and is far easier.

1. plusses and minuses are cryptic - how about icons?

3. relation of cursor to image in panning is inconsistent; slow response with no status feedback

7- did not look at help yet

2. double-click on text is inconsistent with both single-click on text in Mosaic and double-click on icon in workbench.

7. (a) Help is inconsistent look/feel with workbench and advertising service. (b) Too many acronyms without explanations. (c) I didn't understand the script commands stuff. (d) It was hard to read and could benefit from a hypertext structure.

When an image is loaded, EOSView should attempt to show all the colors possible by rearranging the colormap since many images do not require 256 colors.

There was a problem loading the large demo images from JPL. The program did not recognize the size of the screen and displayed the right side of the image off screen.

I think it would be more natural that the center of zoom would be at the cursor, not the upper left hand corner.

It would also be helpful to show the area of zoom in the thumbnail image. Some simple image processing capabilities would also be useful.

The features I would like to see are contrast enhancement, display x,y, z values at cursor and image smoothing.

From the JPL folder, I double-clicked on the first icon (88307h09da-adm.hdf). An EOSView window opened with file name and contents. I then used the menu to open the File/Open option. The first time I did this, it opened with the filter set to

the HDF_SAMPLES directory. I clicked on cancel to close that window, and tried the File/Open window again from the same location. This time it opened with the filter set to my home directory (/users/drm). This was repeatable.

Section II.B.2 of the Help information was useful, but could be improved. There is no explanation of what a Raster Image Group or a Vgroup are. Not all users will be familiar with HDF file structure.

In EOSView, when I brought up an image, I clicked the mouse in the browse image shown in the upper left of the screen. Since a crosshair is used as the icon, I assumed that the center of the crosshair was the active part.

Instead, center of the crosshair indicates approximately where the upper-left corner will be displayed. If a different icon is possible, or if the active area of the icon can be modified, it might improve things to make the change.

When I opened the file .../JPL/88307h09dd-adm.hdf, I got a message about a lack of memory, and would I want to continue. I continued, and the image opened and the in EOSView. I could successfully move about the screen by clicking the icon in the browse image. When I clicked on the Zoom-button, nothing happened. When I clicked on the Zoom-button, I received a fatal error message: Error in file:SiVImage.c, Line 238, Message: Error allocating memory (33554432 bytes), Exiting..Not good. This was repeatable

In the best tradition of idiot-proofing software, I tried to ignore or forget what I knew about the HDF viewer. I play an idiot with embarrassing ease. In using EOSView, I found the controls to be straightforward and easy to understand. Even I was animating images in no time. With smaller images, the zooming was good (I would prefer some control over the stepping, which I did not see if it was available). The pan feature was not obvious to me, but I stumbled upon it eventually.

I did not understand the spectrum of colors that runs vertically next to the image viewing area. It's very pretty, but I didn't automatically know what information it was providing.

I think labeling the Zoom buttons "Zoom in" and "Zoom out" would be more understandable. "Zoom +" made me think about what "+" meant, whereas I know immediately that "Zoom in" means to get in closer/make the image bigger.

EOSVIEW: When I used the "entire palette" it really screwed up my screen.

I wanted to view other files in the HDF samples directories but I couldn't find them with the graphical file locator.

The animation option was cool, but I wasn't sure what I was looking at. 6:30 went home

I think it should contain the ability to review metadata--this is critical.

EOSView is great

Step 70a - Looking at an image, selecting the greyscale palette; why are there still colors in a greyscale?

Also under the palette Antarctica is misspelled (Antartica)

Not crazy about the idea of getting a listing of HDF file attributes that looks too much like the output from "hdfed" utility (which I always disliked because of its obscure references to tags numbers, reference numbers, etc).

Can't this output be in simple English, rather than using NCSA terminology? What ordinary user is going to know what SDS or vdata or RIS8 are?

One should be able to click on the ascii data descriptions within the HDF file also so that the user gets an idea of whats in the file and the parameter that is to be viewed.

When looking at the HDF images (I tried the TOVS files at GSFC) I had no idea what parameter I was looking at , and there were no scales associated with the palette.

As it stands, EOSview appears no different (or any more useful) than the rather primitive NCSA visualization and listing tools.

Overall I would say not bad. But I would stick to a single proven way to search for data and data information rather than complicate things with several options.

Also, I was disappointed with the HDF tools under EOSView - it seems that trying to present information to the user on what's exactly in the HDF file (in a language the average person can comprehend) is still an elusive goal.

Went into hdf samples from main menu. Pressed image_demo.hdf tried to open /disk2/src/EP4/data/images/ASF/SEAICE/5496010A.HDF it printed up machine type (107/4369) number type (106/1) raster image group (306/1) (these number make no sense to me...do I need to know them) (also if the user will be waiting more than a second or two let then know...ie. print, 'Processing...') (I had to double click on a file selection tool directory...may want to let the user know they have to do that...in some

'widgets' (like the ones in IDL) you don't have to double click to get to a new directory ie .. or SEAICE) (Will something eventually display here? (I don't have the manual...I pressed amin_demo.hdf tried to display /disk2/src/EP4/data/images/ASF/geology/20347200.HDF once again I got what look like to be stats for what looks like it might someday be an animation sequence? (no telling what it's supposed to do since it told me nothing but stats.)

From the workbench I went into /disk2/users/dvulcan/.ecs/HDF_Samples/ASF/galciars and double clicked on 33443200.hdf it came up with a message window that said File needs to be an HDF file...I thought it was one.

Went into EOSView...I get a little intro window and at the bottom it says to 'Select an HDF file to open.' I was not sure of what it meant so I went to the help in that window, pushed about and got a funny little message

that said EOS view 1.0 created 12/12/94, not what I expected to see I thought maybe I could tell it what I wanted help with. The general help was no help in finding out how to select an HDF file either. One thing you might want to add is a topical help

(ie. the help comes up with a list of help topics like in the workbench's help when I figured out how to get into to help on EOS view. Where I finally found the answer to my question Under EOSView Main Window & Functions. (YAY!)

I continued in the EOS view and selected an HDF file. (The little directions at the bottom of the window, that say to double click on a group to display...those directions are VERY hard to see. BIGGER type would help.)

When I displayed 00000201.AIR.Browse.hdf, there were two humorous buttons that said 'OOM'. The top one apparently zooms in. The color bars are nice for the user to change.

When I chose the rainbow colortable the time the colors for the background and my own windows changed color to fluorescent oranges and greens. I couldn't get this effect to repeat. (Not that I really wanted it to..) The overlay seems to work quite nicely

I went on to display the data from larc...ARe you supposed to be able to Type in a number at the bottom of the image where it says zoom factor? (I couldn't)

It was good to make the group select dummy proof so I couldn't click on the lines that said -Number type (...I chose to animate some of the srb monthly data I understand this can take a while to set up.

.but someone who hasn't seen an animation before may need to know that they will wait a bit. Just for looks instead of 'Animating Forwards' you may want a slight more professional message like 'Animating Forward Direction'.

The idea to be able to quickly browse data is wonderful. This system is a great start!

Q2. Once I was able to figure out how to display the data it was really easy. Q3. I wasn't sure if the user could pick the area that they zoom in on. Q4. It would be nice for the user to be able to manipulate the color palettes. (ie. stretch, hist eq. etc)

Q6. I realize this is all going over the internet, but it would be nice to speed up the animation. Q7. It is not always clear where to go for help for answers to questions like how do you open an HDF file. Q9. Adjustable color tables are needed.

So I went to the one in the small window below it that looked like it. That worked ok. (Some new users may not know what a granual is.)

Just a note: on the page "Atlas of Mars and Viking Orbiter image-finder" a word has been omitted - "...mars in general, you might ____ the excellent collections of interesting...".

staff were helpful and informative; seems to need a lot more work but evaluations can help; a major issue is to what extent EOSVIEW should incorporate image processing/analysis capability

see detailed comments provided to observers; Question: should EOSVIEW have more analysis capability?

When "Raster Image" is highlighted after being selected, the text is not visible, even after the image window has been closed.

The zoom buttons were labeled "oom", with no way to tell which were the zoom in and zoom out, except by trial and error.

Sometimes selecting a .HDF file by clicking OK resulted in an error message saying that the file is not of type .HDF.

Needs better help system.

I have already filled out the survey in this section before, so I'll just leave comments. Thu Feb 2 09:32:20 MST 1995

EOSview Found out how to zoom in on the section I wish. :) (This was not terribly obvious.)

image_demo.hdf (push this button and it comes up with the eosview window with an error at the bottom saying 'Error Reading: b_srb_monanvgs_8706.hdf.'

tried the SSML_movie.hdf (under /disk2/src/EP4/data/images/MSFC) - even at the fastest speed it was slow.

tried a double click on /disk2/src/EP4/data/images/GSFC/TOVS_MONTHLY_PM_8810.HDF_BROWSE - it came up with the image_demo and says 'Error reading TOVS_MONTHLY_PM_8810.HDF_BROWSE' so I went to open it 'manually', and it displayed fine.

anim_demo.hdf (pushed this button and it comes up with EOSview saying 'Reading file: TOVS_MONTHLY_PM_8810.HDF_BROWSE' and a message window that says 'File needs to be an HDF file.'

(then I pushed ok on the message window) another message window came up saying 'Error Reading Animation Images.' so went to open a file (JPL's 88307h09ds-adm.hdf) it came up with a nice message saying there is too much memory taken so there may be undesirable results. (it was horribly slow so I exited the system)

Q1. But I was never sure why I needed to know this file structure. If I really dont need to know it then it's just noise on the screen. If I do need to know it, let me know why so I can make proper use of it.

Q2. It was easy to physically select BUT the names of the things were completely uninformative. I only knew what to select because the script told me what to select. the files needed informative names... e.g. the dataset name and the parameter represented in the image... something that could make me distinguish the files based on the science content... otherwise I wouldn't know how to select any one over any of the others.

Q3. This was very easy BUT there needs to be something on the screen that tells me what I need to do to Pan the image... e.g. click on or drag the mouse around the postage stamp...

Q4. It was easy to use but I don't think it was useful because you certainly don't want to change the palette of the browse image because it was created to represent data values... the only thing it controlled was the background. Maybe being able to control the background is useful... not to me though.

Q7. I don't think I used this.

Q8. These were relatively easy to use. At one point I got confused because I somehow got two EOSView windows open and I was trying to display an image from the folder/file window into the other so I was trying to relate the two... and as it turned out, the second window was extraneous.. which had me sidetracked.

Q9. These functions were adequate but there are other aspects that I didn't see here that would also be useful... e.g. geographic reference map, and image centering or focus point (e.g. click on the point of interest to zoom in on).

I find that having the help screen for EOSView and a higher level than where you actually need the information not very helpful. I tried opening the help screen then minimizing it until I got into the EOSView system but when I reopened the window it was blank.

Also, leaving the help screen open until I got into the system didn't work because when successive screens open on top of it they wipe out whatever is underneath. All in all displaying a ".hdf" file was accomplished by trial and error.

Another annoyance I encountered was the inability to close windows.

I opened an EOSView window in the HDF system and couldn't get it closed, the 2 help screens I opened and minimized wouldn't close and a clone of the workbench window I opened I couldn't close without exiting the system.

1) I experienced problems trying to overlay images - it appeared to quickly overlay image, then redisplay original(?).

2) navigating (i.e., moving around on zoomed image) I seemed to click on one position (above equator) but display moved to area below equator.

3) I had a window hang - any position within window the cursor displayed as an hour glass. No buttons would work - file, palette, or whatever. The window menu button (upper left button in window "frame") would display the options (restore, move, ..., close) but close wouldn't close the window. The screen bottom indicated reading image 2 of 3.

The window on the work station displayed the following message. Execute `#/disk2/src/EP4/bin/EOSView /users/emily/.ecs/HDF_Samples/JPL/88307h09d d-adm.hdf#`

After "iconifying the window, I tried to open a second copy of the document, but got the message not enough memory. At some point a dialogue box was displayed indicating "error in file SiVImag e.c

Line 43 message: Error allocating memory (8388608 bytes) Exiting..... OK" Please note that this box was buried under some other windows - so it took some time to discover it.

I wanted to be able to draw a polygon (on the big picture) around the area I wanted to zoom to in EOSView. Using the small map icon is much more difficult - RR

Today is the first day that I have been able to display images using EOSView. I don't know if you have changed something in the system or I am just smarter about how the system works.

At any rate, displaying raster images by first clicking on the EOSView icon and stepping through the subsequent menu's easy. The help screen was available and useful. There are only a couple of things I would mention:

1. The zoom buttons say "oom" and there is no + or - displayed on the buttons.
2. In the animation scheme the help menu says there is an "Option" to select "Show Frame Number" and there is no such option on the pull down menu.
3. I couldn't really tell if the panning worked, the image moved only slightly. I don't know if the images were fully panned at this point or if the panning hung up.

I also tried to implement EOSView by first cloning the workbench window and clicking on HDF_Samples and then dragging an HDF file onto the EOSView icon. I thought this should activate the EOSView system, but it did not.

Then when I tried to look at the help screen (from ECS Workbench) on initiating applications I couldn't activate the selections under help to activate.

In the survey for EOSView there were several questions to which I selected 3, because I am not a scientist and have not worked with a lot of these images I don't know if these things are "useful" or not. The questions in question (so to speak) are: 4, 5 & 6.

The HDF Samples option did not work very well. When I tried to select a sample from the Eros Data Center, I received an error message stating that the file must be an HDF file. The name of the file was 00000201-AIR-browse.hdf. It should have worked from what I could tell. The other two samples from EDC did not work either. File access/searching (e.g., in EOSView) would be easier if the directory structure were displayed graphically.

I did not realize that to display an individual component I had to click on its name: the name as displayed did not look "clickable".

I need to play with this more as well. It's a useful tool in general, and I think it is part of what is missing with V0 currently...we tell users data or browse is in HDF, and then send them off to NCSA to get the software to view it.

The problem that I had with EOSView is it assumed that the user knew how to interpret the tags. I'd rather open the file and then have an option to see the details about the file! I'd like to spend more time on this one.

Q1. It would be helpful to have more information about the file/data being viewed within the view window, eg. some header information.

Q3. Once Panning and Zooming procedures were understood, they were easy.

Q4: Palettes obviously have problems conflicting with display palette

EOSVIEW was great for making pretty pictures. But I had trouble understanding what I was actually looking at. The "entire palette" option messed up my screen.

Once got EP4 running from ecs-hp1.cr.usgs.gov, I double-clicked on HDF-samples, then double-clicked on one of the sites or one of the samples animated demos and EP4 shut down. It was listed as a stopped job.

For some reason, I can't get the animation to work, even from the Action|Animate menu.

In EOSview the default palette is case dependent on how the user has set her/his environment.

When [she] logged on the default palette was insufficient for viewing the raster/browse images. For example: -b_srb_monavgs_8712.hdf--raster image group 306/213-

For land data the regions where no data is available are indicated by the same color used to indicate values in the range of 0.1-0.2. The color scale bar for snow/ice monthly coverage also repeats colors for different values.

Selecting any other palette option besides entire palette did not improve upon the situation but actually caused further difficulties. When [he] logged on, the same raster image in the default palette for his environment did have the color gradations that were lacking in [her's]. However, as with [her's], the other palette options other than the entire palette, created difficulties.

This would lead us to recommend that the entire palette be the default palette however additional problems were encountered with this palette. Because of [her] setup display environment, the menu bar was not visible.

It became impossible to continue with the program without killing the program and starting again. The comment on page 18 of the accompanying booklet regarding this problem did not help to remedy the situation.

Also when the entire palette option is chosen the controls for the animation window disappear making it very difficult to use the entire palette option and animate together.

We have several comments regarding the overlay option. When overlaying raster images it would be helpful if the selected images were listed somewhere on the screen. The overlapping of text looks disarrayed and makes pertinent information unreadable.

It may be appropriate to have a overlay deselect option.

Also we were not able to overlay images from different hdf files which may be necessary to the user.

Additionally it would be useful if the user could observe more than one image at a time without overlaying, i.e. split screen.

It would be nice to be able to animate images of the same parameter from different months, i.e. different hdf files.

In the help file the description of the animation menu bar lists "show frame number" as an option. Such an option does not exist in the actual animation menu bar.

Raster image groups need associated descriptions. Selecting a raster image group from an hdf file is a hit or miss process since the user does not have any descriptive labels.

The document title bar for selected hdf files does not display the full title of the file and it is not possible to maximize the window so the full title can be viewed.

We especially were impressed with the animate option which made viewing images easy and enjoyable. The pan options and speed control were great!

So I went to the other help...found EOS view it told me all the nifty functions of the EOS view application NOT about the data I was looking for ... in fact I could not find help on where to find any type of data what so ever.

EDC: I chose EDC and found images with .hdf, clicked on one and it died. :(But there are two ECS processes running according to pv. So I killed them...

Comment: I was working with EOSView and several things happened: a) I couldnot resize EOSVIEW window. b) EOSVIEW window is not refreshed. The content dissapears if I move another window on top of EOSVlew.

My impression is that V0 has more functionality than this version. Is this V1? At least browsing was easy with V0.

Content of the EOSVlew window and associated windows dissapears if another window is displayed on top of them.

I was using the window to display the selected images. I see four buttoms to advance frames, stop animation, etc. If I want to advance one frame at a time I can't do it. When I selected >|, I think it should advance to the next frame, displays it and stop. It does not stop, ti goes to the next frame. I don't think the speed selection works. I don't see any change if I move the scholl to the left or to the right.

I tried to close the EOSView windows and the system doesn't let me do it. Why? The first EOSView window does not have a close or quit option.

The following Document Tile windows has a close option but it does not work.

The hdf file "table of contents" is shown very well. The tag/ref values that also appear probably will have meaning to very few people however. I would also like to see any lables or attributes printed along with the HDF objects.

On the pan and zoom. When I first saw this it was not clear where the pan and zoom widget was located. Perhaps this could be made more clear.

I also expected to click on a portion of the image in the pan/zoom window and have that point centered in the main window. This did not occur and was a little bit of a surprise. Once I got the hang of it I could pan easily though.

Palette selection was easy, however I wanted to load in another palette I had on hand and was not able to do that. This is an option that would be very useful.

I am using EOSView stand alone as another HDF tool. I find its capabilities very useful. The animation feature is better than the one NCSA Collage offers. I do really need the option to load additional palettes though!

EOSView presumes fairly detailed knowledge of HDF on the part of the user.

For the animation feature to be really useful, it would be better to have a time series of one parameter, rather than a set of parameters for the same time period, in one file.

Different palettes are nice, but not particularly useful without some kind of legend.

To make the Pan feature even nicer, outline the zoomed-in area on the small image.

The user interface in EOSView needs a lot of help.

You need to keep your menu bars standard. (Set the XmNmenuHelpWidget property of the row column widget to the cascade button for the menu.)

The view areas for components would be much easier to use if selectable items had an icon to their left that indicated what kind of component it is. This window should be resizable so I can see more of the choices.

The controls for the image view window could be better organized. Also, the panning control needs to be labeled. I didn't know how to pan without checking help. (Panning is important enough that a person should not have to check the help to learn how to do it.

(Where's the scrollbars?????)

The help feature is poor at best. This should be a text widget with a scroll bar, rather than having page up and down buttons. (For an example of hierarchical help, check out the Langley IMS: telnet eosdis.larc.nasa.gov, account ims, password larcims.)

The animate feature would be more useful if you could animate a set of image files instead of images in a file. This would work better for the Langley SRB browses, where the images in the file are different parameters rather than a sequence of images. For example, it would be nice to be able to animate image 10 of a certain set of files.

The image processing was nice. These should be available on the WWW. Being able to choose the palette will help the 20% of all scientists who are colorblind.

deviated from step 65 on purpose

wasn't clear initially what filter button is for, expected ok button to figure out that i had a directory selected and do a filter for me ...

when selected a directory and used ok button got error message which confused me (later noticed that filter was highlighted; that's a good clue anyway; noticed "return" would have worked as well as double click)

after error message was pushed up to top level directory so lost sight of where i should be (not good)

step 67 no .txt files listed

step 69 fails says needs to be hdf file and it is

is very much a pain in the ... to have to keep going back through all the directory structures to get back to the point to have it fail again (boo hisss!)

wait a minute when i started EOSView over the directory for the images is not the images under my directory .ecs but rather EOSView goes to /disk2/src/EP4/data/images/ASF/SEAICE/* ... perhaps the files copied to my space at the creation are not the same as the ones in /disk2/ - if so thats bad ... checking with ls and diff unix commands

after error message was pushed up to top level directory so lost sight of where i should be (not good)

ok the files are not the same for one thing mine end in ".hdf" and /disk2/'s files end in ".HDF" -- this is the source of much confusion

also my files have me as the owner and /disk2/ has tcollins as the owner -- what is this restricted data or something

unfortunately this minor problem will be the source of bad scores i'm sure (all one has to do for a work around is to go back to the workbenck icon and restart from their to get into the intended directory)

tried the above scenario on the DEC alpha and guess what the error message does not cause a directory change!! this problem is not repeatable on the DEC alpha but is on the hp... both machines are using the same environmental setup calls the two machines dont behave the same

step 77 - this caused my windows to be so messed up that I couldnt find the buttons on the window to go to step 78

went back to step 76, skipping step 77

step 79 brings up the filter window !!! with my directory and not /disk2/ diectory - I'm not goin to fall for that again {:-)

manually walked through directory to get to the right place

not a step but when I brought up a new image it seemed not to do anything, however now I notice that the image changed but the Document title did NOT change which is the reason I'm confused. I confuse easy {:-)

overlay just seems to whipe out what was in the previous window and forgrt to update the document title - not good but maybe we have a bad scenario using a black and white radar image

Overlay has meaning if you have a flicker option so that you can bounce between images to see the change but this only works if two images are geometricly corrected and orientated the same in the window -- what is intended with overlay?

I'm playing with EOSView; it has a File option in the upper left hand window. This gives me a list of images, but I get a message: file needs to be an HDF file. Why the list if the images aren't the correct format.

I think I know what "drag and drop" means, but it doesn't seem to want to work. I can't get the EOSview window to come back after I exited out of it the first time.

I got the HDF_samples window and the anim_demo.hdf. I was able to look at all 3 TOVs scenes, but they didn't wnat to cycle.

I got the HDF_samples window and the anim_demo.hdf. I was able to look at all 3 TOVs scenes, but they didn't want to cycle. Now I think they did cycle, but this is a strange animation style.

It does 1 2 3, but it doesn't do 1 2 3 over and over until you stop it.

Wow, I was able to make this window bigger all by myself.

I think I'm beginning to get it: The anim_demo.hdf gets me EOSView: TOVs_monthly_PM_... and the image_demo.hdf gets me EOSView: b_srb_monavgs_... The annotation "b_srb_monavgs" isn't that informative. Neither is "Raster Image Group (306/208)".

Back to the TOVs; I like them better. I was able to work the zoom function and call up all the palletes. The palletes are strange. I selected them all on the TOVS, but when I tried to go back to default, it made my whole screen purple. When it's purple, I can't see where to hit file and quit my image. I called up a second TOVs, and it didn't have the purple problem. I finally got rid of my purple TOVs by closing out the EOSView: TOVS_monthly .. window.

I've gotten another clue: I click the ASF folder, then go to Action and open. I guess double clicking does it too.

I went into the JPL folder, and it told me that my chosen image would use an excessive amount of memory which may cause undesirbale performance results. It takes forever for some of these windows to come up, and I wonder if this is because I did something wrong, or because the system is slow.

I'm playing with EOSView; it has a File option in the upper left hand window. This gives me a list of images, but I get a message: file needs to be an HDF file. Why the list if the images aren't the correct format.

I think I know what "drag and drop" means, but it doesn't seem to want to work. I can't get the EOSview window to come back after I exited out of it the first time.

Well, what about that!! the advertizing window mysteriously appeared!! Wow, I got TWO EOSview windows!

I got the HDF_samples window and the anim_demo.hdf. I was able to look at all 3 TOVs scenes, but they didn't wnat to cycle.

The zoom buttons look like "OOM".

The zoom function is extremely difficult to navigate!

When I zoomed into the image under /ASF/SEAICE, there was no small image at the left of the window and so I had no way of knowing how to move through the enlarged image. When I opened both of the animation windows for the first time, they both quit within

When I opened both of the animation windows for the first time, they both quit within a few seconds. Only on the second attempt was I successful. Loading the images for the animation sequences is very slow.

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When I opened both of the animation windows for the first time, they both quit within a few seconds. Only on the second attempt was I successful. Loading the images for the animation sequences is very slow.

Need a way to easily go back to a zoom factor of 1.

The "Use entire palette" option on the pulldown menu should be a toggle button or have something to indicate whether the option is off or on.

After opening the HDF_Samples window, double clicking the image_demo.hdf icon gives the error "File needs to be an HDF file". The same error appeared when the anim_demo.hdf icon was double clicked.

EOSView: Again, the window opening directly on top of the Workbench window is distracting.

I'm going to assume that the ASCII-text help screen is a not-yet-fully-implemented area.

Several of the image files encountered memory allocation errors; the exact behavior of the system, or the expected actions of the user, were not clear when this happened.

I don't understand the first paragraph of the EOSView help page.

Nope - I cannot launch the Advertising Service. I liked EOSView, and find it intuitive and pretty easy to use. The biggest trouble with it is how slow it is. I won't try it again, because it is so slow. Maybe, for evaluation purposes, very small images should be included. The JPL SST image I displayed was pretty big.

The reason that EOSView isn't easy to use now is primarily because of how slow it is. I never got to zoom, or change the color palette. I waited at least 15 minutes for the image. After that, I just wanted out.

I am also not so sure most users will be as familiar with HDF file structure as I am. Will most people know what an SDS is? Never got to animate in EOSView.

3/3 Am now working at Dan's workstation at Langley and so can see how EOSView is meant to be. I like it. I like the zoom and pan features. Sometimes I have to double-click and sometimes just click once; this gets confusing.

Which files are for display was not clear. Why not label them as to what they are?

the color palettes were very strange. the greyscale had colors in it, for example.

It exited from EOSview unexpectedly once.

I don't like the choices for the color palettes.

What does the overlay do? It didn't seem to do anything.

Why are the images completely without labels?

Changing the color palette sometimes loses part of the image.

I hit an HDF file and the whole thing crashed.

The zoom function was unclear. How do I choose what portion of the image to zoom in on?

It takes forever to zoom in or out. Is there a way to abort if it is taking too long?

For some reason, I have a very hard time selecting a component out of the HDF files. I have to click and click until eventually it will be selected. I'm HDF-impaired.

When panning an image, the two images don't track together well. The area you point at with the mouse doesn't correspond to the view in the large window.

It's nice to select different palettes, but they take over the whole monitor and you can't always see the menu picks to get back to the original palette. There should be a key so you can tell what values the palette colors correspond to.

I feel that when browsing an image, scroll bars on the window would be more intuitive to users. Most of the other screens are designed this way and the change was confusing.

III. EOSVIEW: 1. I like the "+" to indicate more information is available about an image. However, since I am not an Atmospheric Scientist, I am not sure WHAT to do with the information.

IN the EDC 00000210-AIR-browse.hdf, Raster image group (306/2) the button does not have entire label-"OOM" rather than "ZOOM". Also in the ASF, LaRC, NSIDC, GSFC images.

2. ? IS there supporting documentation for the images?

3. In choosing JPL/88307h9dd-adm.hdf, it was nice to know up front there might be memory problems with the display.

4. The files are cryptically named; I assume that there is some type of naming convention that may vary from product to product.

Perhaps a file at the HDF_Sample level that explains the file naming convention. I am guessing that the JPL mentioned above is for 1988 julian day 307, ..?

5. More functionality could be added to EOSVIEW -- graphical subsetting

1 - associated metadata and image names would be helpful. 5 - it'd be nice to be able to animate all images in a directory say for example if you had 365 images with 1 layer each, rather than 1 file... (for browse that is created AS dat are produced).

On my workstation (and SGI 19" console) I didn't have zooming - I had two buttons that said "oom" and either the response was slow or I was slow, but I found it tough to use.

I take back what I said about about displaying metadata being helpful - it is NECESSARY.

Please take a look at the "Browse-a-rama" helper in mosaic that views HDF files. It gives a nice postage stamp, with a phrase "this image has dimensions x by y and contains the following descriptons info <insert annotations from file>" It's a nice overview before subjecting users to words like "number tyoe, numeric data group, machine type" and other HDF guts that many folks don't want to know about.

names didn't tell me anything about what data was (perhaps not a problem from user community of scientist??) and zoom little window does not give a WGSIWYG view of zoomed image

1) Why is this application so small? Has it been smashed from both the right and left?

2) Q: 1) I don't know. It was not obvious to me that is what I was looking at.

2) Zooming is not very intuitive. Why not show a box in the overview that shows me what I'm looking at in the zoom view.

3) Why doesn't the location I pick with the cursor in the overview become the center of the zoom view?

4) When using the full color palette a series of key strokes needs to be available to get out of full palette.

5) Also, what good is a color palette if I cannot control contrast, brightness, enter my own saw-toothed ramp, etc., and be able to cycle the colors. Standard image processing enhancement techniques.

6) Using the full palette I was able to crash the program.

8) I do know the internal structure of HDF. If I did perhaps some of this applications importance would be more meaningful. I cannot adequately critique how easy it was to look at HDF datasets.

9) Help should be a resizable window so that I can determine how much text to look at.

10) I guess the functionality is ok. My socks were not knocked off. It could just be one of those days. I'm not sure where this application is going. Perhaps the big long haul picture would explain the significance of this application.

2. Once you choose a directory, things become very unclear. None of the files are named something that makes sense. raster image group? not intuitive that you should click on that! Why so obscure?

If there are three raster image groups in one directory, which is what? There is no way for the user to know. Admittedly this is supposed to test functionality, but this listing frustrates the user.

Why not name the files and hide the files that the user cannot access.

3. panning and zooming is a real problem. I was unable to manipulate the file to my satisfaction. When I want to zoom in, I would like to choose what portion of the image I zoom in on.

Also, it is incredibly slow, sometimes. I tried it several different times on two different machines. Right now I am on Ellen's HP. Zooming in and out is very fast. On my Decterm, it is painfully slow, at least when I tried it.

4. I could not figure out how to use the overlay. It crashed once while I was using it. And other times it did not do anything that I could notice. Worse, when I say 'overlay' on Ellen's HP it puts me in my main directory not the ep4 directory!

4. No labels on anything! no scaling, no descriptions, no titles. EP or not, this is viewed very negatively by the scientists. They are not interested in unlabelled pictures.

5. Having palette choices in general is a good idea. Different colors tend to highlight different features. The color choices available, however, are rather strange. I am assuming that that will change.

EOSView: the user should be able to stop the animation process.

2/17/95: allow user to zoom by "mousing" a rectangle print option including the ability to print a subset (defined by a zoom box) of the image.

allow the user to save a zoomed portion of the image.

the system put up memory error when i tried to overlay a non-hdf file. it should display a more useful message to the user.

the system seemed to freeze for at least a minute when i tried to pan using the the small image. i was using the 1st image in the file b_srb_monavgs.8604.hdf

The file selection window should be resizable.

Animation was very sluggish and jerky (remote connection). An option for downloading an mpeg should be set up for this reason.

Zooming in eosview needs some reengineering. Rubberbanding is a more normal method to both specify the percent magnification and the location of interest. Bounding boxes can also be used to specify a region for rotation.

More options should be available for projections. More options should be available for use with multiple datasets at the same time (particularly line graphs). Some method should be in place for viewing absolute and relative dataset differences.

EOSView looks pretty neat from what was in the script! A response of <3> indicates either that I had insufficient background/information to comment or that there was actually no feeling either way.

1. I'd find panning much more friendly if the cursor marked the center of the zoomed region not the upper left hand corner.

2. I would have ranked question 2 above higher if I had some clue as to what I was looking at when a scientific data group was being displayed (i.e., displaying it was easy, understanding what was displayed was impossible).

3. I would have ranked question 1 above higher if I had some clue as to what the pieces displayed were (i.e., the structure was defined OK; but, the content was not displayed at all).

Also, while there were numbers next to each entry it was not always obvious to figure out what they meant (e.g., in ssmi_ta_sub.hdf the raster image group has value 306/2, what does it mean?).

entire palette turned all windows off. It is hard to tell if the overlay works, users should be able to go back and forth.

When I chose a new image for overlay the ID of the first image still displayed on top and its not showing anywhere the ID of the overlayed image.

The EOSVIEW Screen does not refresh or when it resizes never refreshes. Difficult to work with. Cannot kill the window either

A timer would be useful to have to know if I am waiting for the window or not ...

The EDC HDF Image seems noisy and using a rainbow color palette does not enhance image quality

The color tables do not work very well on the SRB images from LARC.

Switching from color to gray scale does not produce expected results.

Help on EosView was not at all useful lot of words like clutters. Overlay function did not work. Magnification factor shown on the left corner of the image sometime did not appear and the complete bottom area was appeared black.

I like the general functionality of EOSView. I believe this will be a helpful tool for user's. I did encounter some problems. Some files could not be opened because they were not ".hdf" files, although it appeared they were.

For example, anim_demo.hdf could not be opened. Is this an hdf file or not? Likewise, with Goddard's TOVS_MONTHLY_PM_8810.hdf file, I get the same error, not an hdf file.

If these files are not hdf, I think the ".hdf" ending should be dropped to avoid confusion.

Animation function did not work

General

My first session with EP4 has not gotten very far, things are extremely slow - will try to logon at a different time of day. I was able to get to EOSView, but it was taking more than a few minutes to update the image display, so I gave up on it.

The Advertising Service had still not appeared by the time I logged out. By the way, selecting exit bumped me out of my telnet session completely. I didn't expect that, thought I would still be logged in, and could start up ecs again.

Hopefully things will go better next time - maybe the weekend is a better time to try.

My mistake, I did not get bumped out of telnet (I just lost track of the window I started it up in), so I started ecs again and I see that my previous comments are showing in this window. I wonder if that means it is a file I am continuously appending to, until someone comes to look at it, in which case I could edit comments I left here before. Or am I now saving another set of the same comments?

1. Cannot access "advertising service". When I double-click on it a message appears in the xterm where I started the session saying "Cannot read HOME_DOCUMENT, exiting..."

2. System overall is still too slow to use. Here are some timing stats from my session today, referenced by the item number in the User Script paper:

item#	description	--	timestart	timedone
2	mosaic help window	--	15:37:50	15:39:00
62	-- open EOSview window	--	15:40:30	15:41:00
70	-- display image	--	15:44:50	15:46:40
71	-- zoom image	--	15:47:00	15:50:10

item# description -- timestart timedone: refresh obscured image window 16:03:30 16:08:00 That's as far as I got with trying things before giving up in frustration.

Is the 1-800 number listed anywhere in the EP4 ? I couldn't find it

I'm using an x-windows emulator on a pc. It doesn't work!

The initial login window does not resize so that the login buttons can be seen on a 16" screen. This needs to be supported, because you can not expect everyone to have at least 19" screens.

For security purposes, I would think that there should not be a response identifying invalid login name, but rather an invalid login/password combination (especially since the passwords are so easy to guess).

It would be nice for highlighted text to change color once a path has been traversed (like it does on the Web).

It would be nice to be able to save help and information windows to a local file that they can printed out.

When users store files in "save as" in the help they are being stored to /disk2/src/EP4/bin. This will tend to clutter up a public area with private files. Perhaps, EP4 should be set up to run from the user's home directory instead of the bin area?

I ran into problems where when I launched the Advertising Services, EP4 would crash (all windows would disappear) and I would be thrown back to where I invoked ECS with an error message of fork:not enough space.

This occurred when someone else was using Softwindows.

On the login screen, it doesn't give an indicator that it has received your input and it processing it. Some systems use a little clock icon to indicate the machine is 'thinking'. This sounds like a nit, but *everyone* I've shown EP4 to makes this comment

This comment was also made about EP3. If there's any way this can be modified, I'd do it. It irritates users!

In general I thought more help was needed. See comments under the advertising service and the workbench.

In general, I really liked EP4. I especially like the advertising service - I was skeptical about how it would be implemented, and am very impressed with what is shown here.

Should have scroll bars in the interactive evaluation tool top 2 panes.

Implementation of the "ACTION" menu needs to be changed to continue to show what icon has been selected. For example, when single click on Adv_Service and then go to ACTION, then the outline for Adv_Service is no longer available.

You do not know what is being executed until it comes up if you have a short memory span.

Help - It would be nice if there was a single place that explained the menu options on the ECS workbench. For example, it would be nice to know up front that the Action menu will only contains entries applicable to the current selection.

EP4 window layout (at least for IET) is not easy to understand. Divider lines were not explained.

Between the process of minimizing the IET window and restoring, I somehow hit or moved one of the lines and ended up with a window that had 8 inch ok, save, prev, etc. buttons.

Through accidental experimentation, I discovered the problem. Granted, I have not read all the documentation thoroughly, but is this documented?

Help - On advertising service window, when pressing 'help' at the bottom, I was taken into the EDHS home page. What has that got to do with the advertising service. I thought it was going to give help on the advertising service.

Also, in this case, is there any reason why 'help' is not at the top of the screen as opposed to being at the bottom? I like consistency.

This machine is slow -- it would help if you added stopwatch icons after picking menu functions and after login. I keep thinking it hasn't worked and trying to do it again.

Unexpected Network Read Error occurred a lot when I first tried to use the advertising service.

The EP4 software worked well. There were some minor problems with implementing DCE on our Sun Workstation. I was also disappointed that none of the services provided any real data.

Navigation was fairly easy for me, but there may be some problems for novice users. It would be useful to provide positive feedback when an item is selected.

The file and action menus may be confusing to people used to seeing an Open or Run item under the File menu.

I think it would also be useful to provide an Info item under the Help menu that would provide specific information about an item such as where the link points.

The URDB is labeled as RRDB in the Tools menu. It also brings up a Mosaic page with a pointer that says the database has moved.

I'm not sure I agree with the design decision to place everything in a 'dot file' under the user's home account. Once data files are copied over via Version 1, the user will use those files with other services and applications outside of V1. Most users have their Unix accounts set up so that they do not automatically see their dot files when they do directory listings, or when application programs present lists of files to open or manipulate. So it might be hard for some users to reach into these directories to pull stuff out with other tools. It's not a huge point, obviously. And I don't know if the default directory name will be user configurable, which would alleviate any problem with the chosen name. You don't like, you change it! My personal feeling is, I like having it in ~user/.ecs. I just know some people that won't.

I've placed loads of comments in this General section, as well as some in the other subsections. I messed up originally by putting a lot of EOSView comments in this section. It also contains a lot of Workbench comments. Sorry about that; I didn't catch on to the obvious for a little while.

I've included a lot of things, both large and small. And very small. One thing I want to acknowledge right away is the 95% of everything that looks great, and works great. It is much easier to write a comment about something that doesn't work

than it is to write about something that works so well it seems obvious and not worth comment. After some bumps early on, the IET seems to be working very well. I have found it easy to move around in it, and enter comments in a number of ways. For example, copying in error messages and such.

On the HP, the interface looks good. It is not overdone, and blends in well with everything else. I'm glad you didn't make it too flowery or obnoxious. I think all the work shows. I hope you get the results from the Evaluators that you are looking for.

Error on startup: when I have both Netscape and Mosaic running and attempt to start ECS, I get the message below. This could be more descriptive, as it does nothing to tell the user that ECS cannot start because of problems with the color mapping.

There are two separate problems here: the fact that EP4 will not start when there are certain problems with the color map; and the fact that the error message for this condition is not sufficiently descriptive.

The error message received is: <wave /users/drm>ECS, Starting ecs, \$ECS_HOME = #/disk2/src/EP4#, Host Name = #wave#, Process id = [744], X Error of failed request: BadDrawable (invalid Pixmap or Window parameter), Major opcode of failed request: 14 (X_GetGeometry), Resource id in failed request: 0x0, Serial number of failed request: 205, Current serial number in output stream: 205, <wave /users/drm>

During EOSView startup, the icon changes to an hourglass. So icon changes are incorporated, but not universally.

In the IET, there is a button labeled "OK". I don't get it. OK, what?

5:25 followed steps on p6 ep4 package. 5:30 forgot password (consulted AK and Carolyn) 5:35 followed instructions to login

Welcome screen: What is a DCE? login failed so I logged in as GUEST

Once the workbench was brought up I wasn't certain how to proceed. I selected Adv_Service and clicked ACTION. I got a list of services that scrolled off the bottom. I almost missed the second half of the list.

The "NOTE" is unnecessary.

The following steps consistently crash EP4: 1) logon, 2) click on HDF_Samples folder, 3) pull down Action, OpenNewWindow, 4) go back to first window and click Adv_Service

It would be nice to retrieve comments from another day. (ie. if I need to copy them for my boss, and I didn't know this the day I wrote the comments...)

My second access to EP4: 1- Generally, I like the Mosaic-like interface. Users will not have to discover new modes.

2- I installed browse images to my WB, this process is not responsive. Cursor floats around the space, aiming inside the box takes too long, may be a network problem.

3- Tried animation, works well. Palette colors are lousy in my IBM RS6000, so I changed to "select entire palette" for the LaRC SRB images, but there is no save option. I had to change the palette every time I brought an image.

4- EOSView option works well. Tried several images. "Help" works well for most options. After zooming, discovered how to move the image around using help.

5- For HDF samples, selected LaRC, and waited forever (surprising because I am at LaRC). We need something to show the status as in Mosaic clock. I was worried that the system would not come back, it finally did. The images worked well. Then accessed EDC, worked quickly, but not much to look at there.

6- Problem in anim_demo_hdf, image goes out of the screen, no way to bring it back, upper left control section is out of screen. I can only close the animation tool to get rid of it. 7- Accessed EDHS, worked. RRDB sent me to URDB, it was protected, no access. 8- Advertising info is useful.

Operating-system error: Connection reset by peer DB-Library: Read from SQL Server failed. message shows up in the screen for all accesses. Also, more details "here" has a constant text for most usage. I had problems for some access to this option, for some specific services. Can't reproduce it while writing it, I may have been missing something at the time.

9- Services listings, data set listings, metadata search are all useful options. I like the layout of the advertising page. 10- Some browse services are missing, I guess not all services are applicable to all datasets.

Overall, it is fairly intuitive to use. Better than V0, but then again there are less options. Mosaic interface is a very good idea. Will try again. Haldun Direskeneli - ECS Scientist at LaRC DAAC

Much of the EP4 navigation is comprehensible, however, I had trouble using the ECS Workbench. Displaying HDF files was unclear, and awkward to use even after discovering how to actually display the images.

I only made it through because the script led me through by the nose but I wouldn't have made the selections based on what the interface communicated to me. Better affordances would be useful.

Also, interacting with the interface changed throughout the system... e.g. sometimes it required a single click and sometimes it required a double click. Or sometimes it required the left mouse button and elsewhere it required the middle mouse button.

This needs to be consistent throughout the system. Also I was shocked by being dumped into a mosaic interface with completely different options at various points throughout the system.

This should be incorporated in such a way that the look and feel are consistent in a seamless way.

Q2. It was fine as long as I didn't have too many things (icons) on the screen. Once things started running off the screen I forgot what was on the window (workbench).

Q3. It didn't answer my questions and it dumped me into a different system that behaved differently. It would be better to link to the part that I needed help on... not make me go through heirarchical paths to find what I need.

Q4. I couldn't find what I was looking for.

Q5. Its neat but needs to approach the system with the users thought process. not the system information architecture. eg. the user doesnt care who holds the data, I just wanted data. and being faced with a screen that made me select ECSvsEOSDISvsGeneradata

I didn't care. Also, some services shouldn't be presented until they are applicable... e.g. subsetting. I wouldn't just go in and say let me subset (unless I had done a previous search and had data).

I do think I would want to go in and say "let me browse"... like going through the mall. but not subset - this is only applicable if I have found data to subset.

I tried login onto EP4 using the ecs-alpha1.cr.usgs.gov site. I got as far as the login screen, but then something went wrong. The login window was still there, but there was nothing in it and I could not close it. Then I logged out and logged back into the workstation. The login screen was gone. Unfortunately, I could not log back into ecs-alpha1.cr.usgs.gov, no matter how many times I tried. Finally I tried the other name I was given, ecs-hp1.cr.usgs.gov. That worked.

All in all I liked the layout and thought that EP4 was fairly intuitive. I don't feel like bring a fresh user perspective to the evaluation however because I've been reviewing requirments and attending alot of these meetings!!

Definently try it out on people who aren't part of the project. As a user services representative

I would like to plan to demo the system to visitors as the opportunity arises.

I thought the help info was too wordy. It looked too boring to read. Also, although the responsiveness of the system was good, there were several times when I didn't know what was happening or if some other screen was going to popup.

Comments from Jay Titlow, scientist.

I tried to log onto ecs-alpha1.cr.usgs.gov again. This time I got on. Unfortunately, my entire workstation locked up shortly after starting EP4 (well, not quite the entire system, my desktop clock still worked, just nothing else). I had to log onto alp I had to log onto alpha1 from a different workstation and kill the ECS process from there. Then my first workstation came back.

For advertisement searches you need to have dependant valids - meaning once a choice is made all choices in other windows which are non-sensical relative to the first choice should be greyed out or disappear.

EOSView doesn't seem to be working anymore (although I'm not sure it ever did :). The EOSView object is gone from the ECS Workbench. When I try to view an HDF Sample, EP4 crashes!

If I try running EOSView from the command line, I get this error message: Warning: l18NOpenFile: Couldn't open file eosview.uid - MrmNOT_FOUND fatal: FATAL ERROR: MSG 0x0053ee5d [CAT 5/3 STD 61021] Category: Correctly requested operation failed (Failed to find) Function: xvt_app_create File: ./xxinit.c line: 84

Overall, EP4 is not a bad system. It still needs more work, of course. And there must be more functionality before any serious ,evaluations can be made of the ease of image access and searching.

In the time that I've spent testing the system, I have become familiar with it and its quirks. When I started testing EP4, I had very little X-Window experience, but even so, it didn't take long to get the hang of using EP4.

EP4 seems to be pretty easy to understand (even the types of objects on the Workbench need to be better identified). And I hope EOSView doesn't become part of the final system.

The Advertising Service is set up well, considering the complexity of the data that will be requested. I wish I could have been able to do actual browsing or searching and get some results.

This would have made it easier to get an idea of what the system will be like to run. Hope this helps!

Subject: Feedback on EP4 The following is a list of pros and cons as well as general comments regarding EP4.

Cons: - There is an inconsistency regarding time pieces(i.e. the icon that is displayed when waiting for something to happen). After the selection of some options a time piece appears while for other it does not, i.e. after selecting "begin" on the logi

We would like to have time pieces appear after the selection of all options. A few times during testing we inadvertently selected the same option more than once thinking that it did not go through the first time. A waiting icon is needed whenever waiting occurs.

Pros!!!: Our overall opinion was that the program was very user friendly. Making selections was straightforward, display options were clear, and it was relatively impossible to get disorientated in the program.

What do they mean by a EP4 window lay out?

Comment 1:I don't have any idea how you want us to evaluate this prototype. I suggest you to provide some help even in this part. a) I don't know where do I identify myself. Here?. I am from IAS.SDSMT.Rapid City.

b) Do the above questions are answered for each comment? c) Where is the EOSView? From the main ECS Workbench window, I don't see EOSView?

Comment 2: I would like to see some brief descriptions on the right hand side of each icon on the ECS Workbench window. What is ASF?

Comment 3: I lost few seconds ago the ECS Workbench window. I was selecting the HDF_Sample icon and the system either crashed or exit.

This EP presumes detailed knowledge of the ECS architecture on the part of the user. You may find knowledgeable reviewers now, but your general user community will be confused as to what an Advertising Service is...

Practically every page I accessed said "For more details pick HERE!!", which always led to a dead end. Where is Details.html, and why is there only one details document for everything?

It was somewhat disconcerting to have 'Help' start up a separate Mosaic application, instead of work within whatever tool is being used at the time. However, it does make for a consistent Help implementation.

It was somewhat disconcerting to have 'Help' start up a separate Mosaic application, instead of work within whatever tool is being used at the time. However, it does make for a consistent Help implementation.

The script was too simplistic for anyone familiar with windows. Actually somewhat confusing.

Will the moved icons reappear in the workbench for a repeat user? Perhaps a local workbench file would be handy for personalizing the service.

o Evaluation complete please send me my questionnaire back in some form so that I can be sure you got all my comments - thanks

o the IET should deselect the save button and give the user some positive feedback to indicate that a save is complete

o the filter button concept causes confusion - not everyone is up to date on the current X-window standards, ie, hitting ok on a directory should be the same as hitting filter - it shouldn't cause a open failure (its not always clear that you have selected

o had several un-explained aborts when clicking on EOSView and Adv_Service - got the message "Cannot open the file EOSView" for example on a EOSView double click

o hope to be able to import our own GIF/HDF files in next version

It takes forever for some of these windows to come up, and I wonder if this is because I did something wrong, or because the system is slow.

I'm saving all this, but there is no indication the save is working.

My xterm has a tiny memory--maybe this is a problem. Here are a whole bunch of error messages which may give someone some insight:borealis> setenv DISPLAY 137.229.31.102:0.0 borealis> ECS Starting ecs \$ECS_HOME = #/disk2/src/EP4# X Toolkit Warning: Cannot convert string "-*-Menu-Medium-R-Normal--*-120-*-*P-*-ISO8859-1" to type FontStruct Host Name = #borealis# Process id = [638] Cancel 2 X Toolkit Warning: Cannot convert string "-*-Menu-Medium-R-Normal--*-120-*-*P-*-ISO8859-1" to type FontStruct #jgroves# #User_Survey# Binding available: ncacn_ip_tcp:192.150.28.17[] Binding available: ncadg_ip_udp:192.150.28.17[] Bound to: ncadg_ip_udp:192.150.28.17[] X Toolkit Warning: Cannot convert string "-*-Menu-Medium-R-Normal--*-120-*-*P-*-ISO8859-1" to type FontStruct XIO: fatal IO error 32 (Broken pipe) on X server "137.229.31.102:0.0" after 390 requests (388 known processed) with 49 events remaining.

The connection was probably broken by a server shutdown or KillClient. X Toolkit Warning: Cannot convert string "-*-Menu-Medium-R-Normal--*-120-*-*P-*-ISO8859-1" to type FontStruct

Well, what about that!! the advertizing window mysteriously appeared!! Wow, I got TWO EOSview windows!

This is a great editor!!

I've sort of lost it in the evaluation book, but I'm having fun, and I'm finding things. What else is there?? I get back to this tomorrow. Feb 15, 1995

I think that in general this is a good system. It will be easier to assess it once more of the features are implimented. One of the main problems is that it seems to be very slow and I was bumped out of the system on a number of occasions which was very f

One of the main problems is that it seems to be very slow and I was bumped out of the system on a number of occasions which was very frustrating.

I was bumped out of the system on a number of occasions which was very frustrating.

I like the use of the Mosaic-like interface for the on-line help. However, I would prefer that the current help window be updated rather than opening a new help window each time I select an item from the help menu.

I was unable to login to the URDB using the rapid login procedure.

ûThis is my first experience with an EP; I didn't love it, and I didn't hate it.

General Comments: The default font size, especially for bold text, is barely large enough to be readable; the user needs to be able to change the font and/or font size.

The Help facility interface should be consistent with the rest of the system interfaces; the mixing of Mosaic and non-Mosaic interfaces is confusing.

The mosaic-like interface is preferable - such things as the cursor changing from pointer to hand on Hypertext links, and links changing to dark/dotted underline after selection.

Some screens offer a "Close" action, some offer an "Exit" action, and some offer both. Are they interchangeable? If not, what is the difference, and why aren't both always available?

Another consistence issue: Sometimes double-clicking on an icon/graphic activates it, and sometimes you have to use the "Action" menu.

This seems inconsistent. (I think this comment came from being able to double-click on the browse image, but having to use the Action menu from the HDF_Samples folder.)

All Help screens need to provide a live-body reference via phone and/or e-mail, to User Services.

1. need watches to tell if anything is happening.
2. double clicks not working.
3. don't like the window colors as they are difficult to read.
4. opening files was confusing. I didn't know what a filter was.

If you know where to start when you get into EP4, it's easy. If you were coming in with no a priori knowledge, you wouldn't quite understand what to do first.

I like having help available through Mosaic for the workbench menu picks, but there needs to be help available in the advertising service (and other services). It's annoying that a new Mosaic client comes up for all help picks, and you can't leave it running and just have a new home page come up within the Mosaic application.

I also like being able to access the EDHS and URDB directly from the menu.

When the IET server is down, there is no message or information displayed -- you only know because no questions are displayed. There needs to be some better feedback.

I didn't realize initially that I had to use the "next" button in IET to get the full set of questions. I had expected to see a scroll bar in that field, since there is a scroll bar for this comment section.

When testing free style I had to restart my session multiple times due to system crashes. (windows disappeared) although I found it fairly easy to pick up where I left off.

OVERALL THE TOOL LOOKS GOOD; YET THERE MUCH MORE TO BE DONE.

WHILE NAVIGATION IS RELATIVELY EASY, FULL USE OF THE SYSTEM MAY NOT BE UTILIZED UNTIL ONE HAS A BASIC UNDERSTANDING OF THE PIECES AND HOW THEY RELATE.

QUERY CONSTRUCTION IS EASY, BUT THE GETTING OF RESULTS THAT ONE WANTS ARE NOT NECESSARILY EASY. (See III,1-6 below).

I. Startup Comments FYI: ENV= Running ECS 4 from my local SGI indigo Workstation:

1. I got a core dump at the login screen by hitting return after my password. I did not hit the Begin button. -- This was due to the execution of SOFTWINDOWS on the HP workstation. I had no idea what was wrong until I contacted my site liason. Still this should not happen. Memory problems?

Performance was fine.

- 1) The survey option needs a selection of don't know, or is not obvious. Example, Q: 4) The help information provided for EP4 is instructive? I did not use the help function, so I don't know.

allow scrolling in help windows

help should be context sensitive.

Navigation would be easier if careful attention were given to changing the cursor to an hourglass (or equivalent visual clue) to show the user that processing is going on.

A GUI is nice, but without a programmatic and command line interface, it is totally inadequate and incomplete. If you know what you want to do, you don't want to putz around with a mouse to do it.

My main concern with EP4 was that responsiveness was very poor. If the system is slow in a test mode with little data, it can only get worse. Responsiveness is a necessity with an interactive tool.

If you highlight a selection with a box, make sure the box on the rightmost objects doesn't extend far to the right

The philosophy of having multiple ways of advertising and querying information is excellent, but is now only implemented in a very limited set of methods.

For general exploration of data, a model "picture" should be presented so that the researcher can pick a point (for instance, a given latitude/longitude point)

It was very easy to step through the scripts, which was exactly what I did. However, sidestepping or experimenting brought dead ends.

1. I realise that this is probably an artifact of networks; but, there are many places in EP4 where it would be helpful if some indication was given that the system was actually doing something (eg.while logging in, waiting for this screen to popup, etc.)

2. It would help the user avoid "shift shock" if more attention was paid to uniformity of interfaces. Simple things like font commonality and whether or not a particular function has a uniformly associated hot key (e.g., exit alt+x vs. exit) are very important in minimizing user confusion. This is particularly important given that the underlying paradigms change from a Mac-like system interface to a Mosaic-like interface to a data manipulation and viewing application.

Given that each data center within and outside ECS is likely to create its own tools,etc. a developer's style guide that is very detailed(i.e., all applications will have the following menu bar structure, file at the right with the following options,etc)in the sense that Apple originally created standards for its applications should be developed and widely distributed.

This EP4 is a great step backwards from V0 IMS: comment from R. Welch. There needs to be a provision for making comments at any place in the menu, not just here. There are so many changes that need to be made, I just don't even know where to start!!

Should be able to change font sizes. Difficult to read the text.

Workbench

I found it confusing that sometimes a new window would open up and other times the contents of the current window would change to reflect motion down a directory tree.

I didn't get a chance to look at the help features enough to make a judgement

found it initially confusing that for some work bench items selecting and then action did the same thing as double clicking (as was expected) but that for others, selecting and action had a different effect than double clicking--- this caused a 3 rating for Q3

It would be very nice for the user to be able to organize the location of icons on the workbench (like one can do with Macintoshes). For instance one could put a row of similar objects along the bottom. I'm not sure whether this would be possible to implement, but it would be nice.

I think I discovered a bug with this one. If you highlight a folder, then go up to action and you can see two selections. Then cancel by moving outside the window and clicking. The folder is still highlighted but when you return to action, there are no selections available.

It is possible to remove the Advertising Services without any additional warnings. I tried this to see what would happen because I know of some people who might do this by accident. I was hoping to see an extra warning message about the consequences of doing this or a reminder of why this was important not to delete. I would suggest an extra dialog box with a message stating that it was recommended to not delete this and the Cancel button being highlighted.

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It would be very nice to allow the user to customize whether a double click opens a new window or a window in place. I for one would prefer the default to be to open a new window.

No help is provided on how to use the file, action, tools items in the top bar of the window. Things like clicking once on something and then executing it via the action menu weren't obvious to me.

(1) The Action->Execute item is unnecessary: I prefer the Mac convention that Opening an application is equivalent to starting it

(2) Drag and drop fn. startup is superfluous since double-click does the same thing and is far easier.

(3) (a) All Open type commands should be under File, context-sensitive or no. (b) I was unable to move icons around on the same level, the way you can on a Mac or Windows.

(3) (c) The distinction between OpenNewWindow and OpenInPlace was lost on me at first.

(4) There are 2 problematic features in the layout (a) there is no way to tell what the icons mean--folder is easy enough, but the application one is not obvious, and one presumes that the iconography will eventually be somewhat richer; would be nice to have access to a legend;

(4) (b) it is unclear why the highlight box goes all the way across the screen.

General: (a) Avoid acronyms as much as possible everywhere, and ESPECIALLY in the menu bar (EDHS, RRDB).

(b) Accelerator keys would be highly desirable

Spell out adv_service

The ECS workbench is familiar to anyone who has used a window type file manager. It might be useful to be able to manually reposition the icons (like a Mac).

The drag and drop feature is useful, but I think it would be more useful to have some kind of command history mechanism. It would also be useful to drag a file directly to the a running EOSView window and have that file loaded.

I lost a lot of comments due to a crash. I'll discuss the crash, then try to re-create my earlier comments.

After starting EP4, I highlighted HDF_SAMPLES and then used Action/NewWindow (I'm not certain of the label, for reasons you should see below). This created a new EP4 window which showed the HDF_SAMPLES directory.

I then clicked on the icon to move up a level, which placed the new window in the EP4 home level. If I now click on the Action menu, no drop-down menu appears.

When I choose File/Close in the new window, it asks me if I want to leave EP4. And if I choose yes, BOTH EP4 windows close and EP4 halts. I would have expected that Close would only close the highlighted window; I would expect Exit to exit the application

I have had a crash. While I could re-create it, and did so a number of times while trying to figure out the steps I had gone through, I suddenly seemed to fix itself. Don't you hate that?

I'll do my best to explain what happened from memory. But I know how difficult this would be to figure out if you cannot recreate it.

After starting EP4, I highlighted HDF_SAMPLES and then used Action/OpenNewWindow . This created a new EP4 window which showed the HDF_SAMPLES directory.

I would double click on the 'go up' icon, to move up a level in the new window.

When I choose File/Close in the new window, it asked me if I wanted to leave EP4. And when I chose yes, BOTH EP4 windows close and EP4 halts. I would have expected that Close would only close the highlighted window; I would expect Exit to exit the applicat

This part was not always repeatable, however.

Another detected problem occurs when, in the new window, I choose File/Close without moving up a level (i.e., the window is created showing the HDF_SAMPLES directory, and I stay there). I choose File/Close, and only the new window closes (as expected).

But in the original window, which is the only one left after the window above closed, if I started clicking on different icons, over and over, just a few times, I USUALLY got a complete EP4 failure, with the message: <wave /users/drm>Starting ecs, \$ECS_HOME = #/disk2/src/EP4#, Host Name = #wave#, Process id = [744], X Error of failed request: BadWindow (invalid Window , Major opcode of failed request: 22 (X_SetSelectionOwner), Resource id in failed request: 0x4001d0, Serial number of failed request: 6766, Current serial number in output stream: 6767

Then, as I was writing this up and repeating the steps a number of times, it suddenly stopped failing at both points outlined above. Go figure. Must be the liquid lunches.

I like the icons. But it raised a question in my mind. I don't know what the plan is, but I would hope that we would provide some type of very limited and basic icon set. Any attempt to give the developers and users a large variety of icons will only result in us never satisfying people. I would hope that the plan is to give people a very basic set, but use an industry-standard icon file format. Then users can purchase icon creation software, and generate customized icons to their hearts content.

I have had a crash. While I could re-create it, and did so a number of times while trying to figure out the steps I had gone through, I suddenly seemed to fix itself. Don't you hate that?

When I choose File/Close in the new window, it asked me if I wanted to leave EP4. And when I chose yes, BOTH EP4 windows close and EP4 halts. I would have expected that Close would only close the highlighted window;

I would expect Exit to exit the application. This part was not always repeatable, however.

I created shaped the EP4 window into one that was rectangular, more tall than wide. Then I copied in lots of icons. Then I created a directory or two. When I tried to move things to the bottom of the window, I wasn't allowed to do it.

It seemed that, as things were added, the working area grew in width instead of conforming to the dimensions to which I had set the window. I should be able to control where icons are placed, anywhere on the screen.

When I moved icons to a new folder, it worked quite well. One thing that would have assisted is a visible change to the icon when it is located over the directory folder in an acceptable position. This is done in the HPVuePad system, for example.

If you move a file icon or name and the icon is not over a subdirectory, it has a definite shape which tells you that you cannot drop the file into the current position. If you move a file icon or name on top of a subdirectory, the icon changes to let you know that you have it positioned in an acceptable location. This is a minor thing, but it can be quite useful.

I attempted to move copies of file icons from the JPL directory into a new directory I created at the top level of the workbench. Using the left mouse button, I am able to move the icons. If there is a way to copy an icon (have the same icon in more than one location, as in Windows et al), we may need to simplify it. I used the standard key/mouse combinations with which I'm familiar, and I couldn't figure out how to do it.

In general, there is no change in the screen once you initiate some type of action. For example, you drag-and-drop an icon. While the action is occurring, there is nothing to tell you that an action is taking place.

In some systems, the icon will change to an hour glass or wristwatch so that you know the system is aware of your request, and processing it. Here, when there are delays in the processing, I am unsure if anything is happening at all.

I went into the JPL file 88307h09da-..., and the message at the bottom of the window said to double click on a group to open it. I double clicked on a group named something like "Raster Image Group (....)", and was told that this operation would require excessive memory. I cancelled the operation. But when I returned to the original JPL file window, the title I had double clicked on was gone. There was just a white area where the text used to be. Clicking on other items didn't change that.

>From Services I followed ECS browse, selected PAL. *double click did not activate the browse I needed to drag icon to my workbench *Delete Item was useful

TOOLS: What is RRDB or EDHS?

Help was boring. I didn't read it.

I'd rather be able to put the icons where I want to, since I generally organize them by how frequently I use them.

Double click options would be better in all places, rather than having to select and then do an additional point/click.

Double clicking on the icons:browse: ok. Continent subset: ok. Land Search: ok. Pathfinder temporal subset: ok. dragging to workbench:browse: ok...did same thing as double click

The workbench help system needs to have much more general information in it. Someone (like me) who is trying to navigate the system for the first time needs help on what to do, why to do it and, of course, information on what can be done.

The menu options need to be detailed. They are not self-explanatory and there is no help on what they do.

Q1. opening things was like the mac... relatively easy. Some things.. like backing up to the previous window was impossible. Once I did things and new how to do it, it was easy but the system needs better affordances to lead me to certain functions.

Q2. First, I never figured this out. I tried to open the folder so that I could drag the other thing into it but it didn't work. Once I did manage to use the drag and drop, I had to do it in two steps because it required two different mouse keys... again, inconsistencies.

4) re-entered ECS and executed eosview by single clicking the selecting the action-execute buttons. Once again I got the above error dialog box - but this time the Package didn't die. The work bench window stayed alive.

Tyring to call up the HDF samples from the workbench still does not work (or I just haven't figured out how to get them to work).

Tools|EDHS This document tool is very useful. It is also easy to use since it uses Mosaid to access the documents.

It is useful to have ALL the documentation on the EOSDIS project available and easy to find.

I really like the workbench layout, and customization features. The only complaint I have is the exploring to get to some of the tools...I would have expected more of them to show up when I perused the advertising service.

Focusing on layout and design issues I generally liked the having the search functinoality, and thought it was pretty straight forward. Functionally spekaing however I had some issues

File|Delete Item works OK for deleting directories.

I tried to open the Action pull-down menu. The first time I tried to pull it down it worked and I saw some options. I let it close and then tried it again, but nothing happened. This is the first time that I can even remember getting any options under

For some reason, the Exit and Close options under the File menu do the same thing. Really, both should not be there if they do the same thing.

In the workbench, there should be an way for the user to change to a higher level directory. The way it is now, if the user wants to go to the root directory, he or she must do so using the command line.

I figured out how to use the Action menu. Apperantly, the options in the Action menu change depending on which object in the Workbench windows is highlighted. This is very confusing! If the options can change, the ones that cannot be choosen from should be dimmed or something. Something should be done to indicate when an option cannot be used. In any case, ALL the options from a menu should be visible at all times, even if certain options cannot be picked at the time.

I used to Action|OpenNewWindow to open a new Workbench. When I double-clicked in the upper-left of the title bar, I got a message box asking me if I wanted to exit.

I clicked left, thinking that only the one Workbench would close, leaving me with the original. However, they both closed. It would be better if the only way to exit EP4 was to close all Workbenches individually. Normally, when multiple instances of a process have been created, you don't want to end all of them by closing one. Normally, double-clicking on the upper-left of the title bar closes the one window, not all of them.

Fri Mar 3 13:16:09 CST 1995 went to test ASF:seaice: double clicked on a icon with the .hdf extention and boom the whole thing disappeared!-no clue if it will display anything or if it died - no warnings....(I did a ps -ef | grep dvulcan and it showed ECS as still running (it showed this line: dvulcan 19718 19703 0

13:14:13 ttys0 0:00 ECS /disk2/src/EP4/bin/ECS several minutes have gone by nothing has happened I assume it died a tragic death. so I try I assume it died a tragic death. so I try to start ecs again...

a general comment: this system does not seem to be organized according to user's needs. For example: under the HDF icon there are all sorts of data places listed they don't seem to be in any order there are EDC GSFC JPL LARC MSFC NSIDC and then a couple demo

Due to the response time between the server and my station, I would like for some icon or message to indicate when I had properly invoked an icon.

would like to see ECS Workbench window banner change as new workbench windows are opened. for example by adding a number to the banner (e.g., ECS Workbench #1, then ECS Workbench #2, etc.)

Some "welcome" screens contain lots of verbiage that may be turned on/off at user's request as opposed to displaying always by default.

I wanted to create a new directory and copy some hdf files into it. Creating a new directory was easy. Opening a new ECS Workbench was easy. I selected a file from the MSFC directory by clicking and then dragged it to my new directory.

This accomplished a MOVE of the file instead of a copy. I was trying to find a way to do a copy without success.

The OpenNewWindow/OpenInPlace action options were fairly obscure. How about an outline structure for displaying directories and files? A view by name/date/icon option would also be useful.

It's good that you have selected HP View's file manager as a model, since the Common Desktop Environment that Unix vendors are heading to uses this (I think).

You need to keep your menu bars standard. (Set the XmNmenuHelpWidget property of the row column widget to the cascade button for the menu.)

It would be nice to be able to do a "rubber band select" where I draw a box around a set of icons and select all of the icons in the box.

Entry in the system through Mosaic may catch NetSurfers with a scientific slant (like myself), is this going to be available on the network?

- o would like to re-organize icons in my own order

- o highlight marker should stay within a few mm of icon

- o resize - return to orig window should keep icon highlighted and in focus in the window

In general, more feedback is needed to let me know what state the application is in. For example, use the watch cursor to indicate when the user needs to wait for something to happen.

It was not very intuitive for me to have to double click on some things to get them started.

It seems inconsistent with the Mosaic interface which requires a single click to follow a hyperlink and with push buttons in a Motif window where a single click activates the button.

Workbench: I didn't like where I dropped the AVHRR icon, but I couldn't move it within the workbench window.

Will there be any other options on the "File" menu at a later date? What is "File", anyway? I've never understood the term in the context of a window display.

HDF_Samples folder: It is not clear whether you should click on the text or the graphic; shouldn't both methods work?

How do you "undo" a selection?

What is the difference (from the EP4 brochure) between "start" and "activate" EOSView?

EP4 Help: The term "launch applications" is not clear.

double clicking not working

It's easy to create new directories, but I haven't figured out how you can move files around within them. The click-and-drag that I expected doesn't seem to work.

2. Upon selecting EDHS under TOOLS on the menu bar, a clock cursor would be nice to know it is working. (Sometimes this is quick, other times not.)

Selection of RRDB failed with ERROR in link to document-- make sure all links are tested and document locations are also under CM.

3. I like the EP4 Help system bringing up Mosaic. It makes a good intuitive Help system.

g1) Refresh should not be under the tools menu. Refresh is not a tool. It should be under the action menu or some other place.

2) I hate little text windows that scroll. Like the one I'm typing in now. Make these babies into pop-up windows that I can resize and move around. Ok, I just figured out how to make the sub-window bigger! Good! Maybe I don't need a pop-up window. I'll think about it.

3) There is no consistency between button labels, size, and position of similar buttons across the bottom of the windows. Example: on this screen the words Prev and Next are used with Help to their right, but not the far right. On the advertise window the words Back and Forward are used with Help to the far right.

4) Also, some windows have Exit buttons and some don't. Such as the advertise window. How do I get out of it?... Ok, Exit is on the File pull-down menu. This inconsistency needs to be fixed if you have control of it. Always use the File pull-down, or always provide a button for Exit. Don't provide both. This issue should be applied to all aspects of all applications.

5) The little select boxes in the survey are too small. They need to be about 50% bigger.

6) Overall the workbench was intuitive to use. It responded the way I expected.

7) The colors of the interface are very pleasing and easy on the eyes.

8) I prefer the size of the buttons on the bottom of this window.

9) I have been playing with the little grab widgets that allow me to resize the various sub-windows on the INTERACTIVE EVALUATION TOOL window. I do not find it necessary for the user to have total control over re-sizing each sub-window. For me to make the buttons huge or small is not necessary. The fact that I can make them disappear is not good. The same is true for all the other sub-sections. I think that somethings should have a finite minimum size and they cannot be sized smaller. To provide total flexibility to the user to the point of hiding information and making information ugly, cut-off, and overwritten is not good form or design. Lets get real, items require minimum space.

10) The Action pull-down menu is not intuitive. I kept selecting it and expecting something to happen before I had selected anything, and so, nothing happened. The case sensitivity of this feature should be reconsidered. Perhaps if it must stay a pop-up should come up informing the user to select something, etc.

11) Q2 of the survey makes no sense. I do not see file to "drag and drop" on an application. Am I over looking something?

12) These prototypes are wonderful. Keep them up. Overall the concepts I have seen here are very good.

The ECS Workbench paradigm looks good, with the minor exceptions I'll mention below.

The windows do not provide immediate feedback to inform the user that a request has been accepted and is being processed, i.e. no "thinking watch" is displayed.

I could not activate items by double-clicking.

When the Workbench first displays a directory, ".." is selected, but no actions are displayed when I go to the Action pulldown menu.

At one point the system dumped core when I attempted to drag a service into a directory I created. I was unable to reproduce the error.

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1. Whenever an icon is double clicked from the ECS Workbench window a new window should pop up (i.e., OpenNewWindow is the default mode for everything).

1)in the login window a)press enter after login and password does not indicate that "begin" is selected i.e. "highlighted"; b: with mouse click on begin it shows the click but its good to have a spinning fish, watch or so to indicate that its working and watch or so to indicate that its working and a second click is not necessary.

2)User survey window: click on save, "save" is highlighted and remained highlighted, so I did not know its done saving.

3)the login window: incorrect login or password return with a dialogue window having only "EXIT" option, how about "RETRY".

4)would like to have the option to be sent a copy of my comments and answers when the screen is saved or "OK" is selected.

5) in the ECS workbench window, File Menu, "Close and Exit" have the same function (which is log out), so its confusing.

6) Overall, I think we will have a lot of happy users, it looks very good.

Expand the acronyms and describe briefly each of the tools.

Maybe an easier solution, and probably more recognized by user's, would be to have an "open" selection under the file menu to invoke an icon. Also, other than double clicking, you can envoke an icon by going to the action menu. This may seem awkward or confusing to user's.

When double clicking on Icons, the response time varies and there is nothing indicating that it has "accepted" the double click - once thinking nothing had happened, I double clicked the icon again, and the system crashed.